REPORT TO THE CONGRESS

The United States Should Recover Full Costs Of Reimbursable Satellite Launches

Department of Defense

National Aeronautics and Space Administration

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

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COMPTROLLER GENERAL OF THE UNITED STATES
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To the President of the Senate and the
Speaker of the House of Representatives

This is our report entitled "The United States Should Recover Full Costs of Reimbursable Satellite Launches."

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Acting Director, Office of Telecommunications Policy; the Secretary of State; the Secretary of Defense; the Secretary of the Air Force; and the Administrator, National Aeronautics and Space Administration.

Comptroller General
of the United States

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ABBREVIATIONS

AFB	Air Force base
AFETR	Air Force Eastern Test Range
AFWTR	Air Force Western Test Range
Comsat	Communications Satellite Corporation
DOD	Department of Defense
ESRO	European Space Research Organization
Intelsat	International Telecommunications Satellite Consortium
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
SAMSO	Space and Missile Systems Organization
UK	United Kingdom

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

THE UNITED STATES SHOULD RECOVER FULL COSTS OF REIMBURSABLE SATELLITE LAUNCHES

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D I G E S T

WHY THE REVIEW WAS MADE

The Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) are providing satellite launches on a reimbursable basis for other governments, international organizations, and commercial corporations.

The costs incurred by NASA and DOD are substantial. (See p. 58.) GAO wanted to find out how NASA and DOD charged costs they incur for these reimbursable launches and whether those charges are appropriate.

FINDINGS AND CONCLUSIONS

Launches discussed in this report were carried out under agreements negotiated by either DOD or NASA, and each used launch services and facilities of the other. (See p. 1.) A substantial portion of the many launches being planned for the period 1974-80 are reimbursable launches. (See p. 9.)

Procedures used to identify and allocate costs of six launches by NASA and DOD did not result in recovery of the full costs of these programs. (See pp. 11 and 30.)

GAO believes that:

--NASA's estimates for the two European Space Research Organization launches would have been increased by about $1.9 million, and

--DOD's and NASA's billings for the two United Kingdom and the two North Atlantic Treaty Organization (NATO) launches would have been increased by about $13.5 million, if computed on a full cost basis. (See exhibit A and p. 18.)

In addition, neither DOD nor NASA charged costs for interest on the Government's investment. GAO's estimates of underrecovery do not include this cost. (See pp. 22 and 43.)

NASA's policy was not to charge certain indirect costs to these launches. (See p. 11.) DOD did not include full costs although it is Air Force policy to charge full costs to reimbursable launches. (See p. 30.)

Both NASA and the Air Force have changed their cost-charging procedures and have taken steps to correct some of the specific omissions and errors GAO brought to their attention. (See pp. 11 and 30.)

GAO also reviewed Air Force estimates of its fixed price charges

for certain other launches in support of NASA's agreements with:

--The Communications Satellite Corporation for Intelsat launches.

--Telesat Canada for Telesat launches. (See p. 44.)

Although the Air Force was aware that the Air Force Eastern Test Range's job order cost accounting system was deficient, it used data from the system to compute fixed price charges for these launches, using cost allocation methods which did not fully allocate costs to benefiting launches and omitting certain costs from the computation. (See p. 44.)

Because costs incurred for launch services can vary for reasons over which the Air Force has little or no control, prices fixed for these services, often several years before the event, cannot be accurately determined in advance. Final billings, therefore, should be based on actual costs. (See p. 55.)

Estimated costs and final prices of reimbursable launches have been computed at less than full costs since the first such launch in 1965, as reported by GAO earlier. (See p. 26.)

NASA stated that full cost was considered but not adopted because certain factors benefited U.S. programs as a result of reimbursable programs. NASA submitted no evidence to support its consideration of such factors and no studies had been made to determine the total costs of the launches or the amount NASA was absorbing.

GAO believes that NASA established its charging policies without a specific assessment of the full impact of those policies on appropriations for U.S. launch programs. To the extent that any of the factors benefit launch programs, all participants, both Government and non-Government, would share the benefits. (See p. 25.)

NASA's reimbursable launches are subject to individual agreements negotiated under the Communications Satellite Act of 1962 and the National Aeronautics and Space Act of 1958. (See pp. 5 and 7.)

It is GAO's opinion that the National Aeronautics and Space Act permits NASA to enter into agreements under which costs to be reimbursed by foreign entities are those as may be agreed to by the parties concerned. Thus no legal basis appears to exist to recover the full NASA costs for the launches discussed in this report, the recovery of which was not provided for in the launch agreement. (See p. 28.)

Nevertheless, because the general policy of the user charges statute and implementing regulations provide for full recovery of costs, if otherwise appropriate, and because the President, in May 1966 and October 1972, had made policy statements that costs should be reimbursed (see pp. 7 and 8), GAO believes full costs should be the standard, as a matter of policy, for establishing charges for launch programs.

GAO believes this principle should dominate launch service negotiations, particularly in the present critical

--Discontinue the use of fixed prices in billing for reimbursable launches until procedures are established to ensure reasonably complete and accurate cost forecasts.

GAO recommends also that the Secretary of Defense, the Secretary of the Air Force, and the Administrator of NASA establish procedures to provide for the timely review of cost estimates and surcharges to assure accuracy and currency. (See pp. 28 and 55.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Air Force said it has adopted and will continue to strive to achieve a policy of full user charges for all launch support services and that any omissions or misclassifications of cost identified by GAO would be given careful consideration in future billings. However, the Air Force believes that the fixed price billing concept will provide a fair and efficient billing method. (See p. 73.)

Although NASA has revised its policy on reimbursement for support of reimbursable launches over the years to provide for increased recovery of allocable costs, the NASA comments on GAO's findings omit a clear and firm commitment to full cost recovery for future launches. (See p. 59.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

The legislative intent is for reimbursement of full if otherwise appropriate costs for services rendered by the Government to persons or organizations outside the Government. However, NASA has the authority to bill less than full costs for reimbursable satellite launches and has a policy of not billing for the full costs of launches, as discussed in this report. The Air Force has adopted a policy of full user charges for future launches. In view of the findings in this report and earlier reports (see p. 9), the Congress, especially the Appropriations Committees, may wish to require disclosure of discounts given to foreign entities and commercial corporations.

budgetary and international balance of payments environment, and because of the substantial portion of launches planned for special interests. (See p. 28.)

DOD agreements with the United Kingdom and NATO are subject to the Foreign Military Sales Act and earlier legislation. (See p. 7.) Because the Foreign Military Sales Act says payment shall be at not less than the value thereof, GAO believes that, in general, all costs of services under the act should be reimbursed and any question of what constitutes a cost should be resolved in favor of the United States.

Further, agreements negotiated by DOD with the United Kingdom and NATO provided for notifying each when cost increases became apparent so that progress payments could be increased. DOD should have determined the costs of these launches on a full cost basis and promptly notified each. (See p. 51.)

GAO believes full costs should be provided for in agreements for future reimbursable launches in the absence of evidence, fully documented, to justify a discount. (See p. 28.)

NASA and Air Force launch costs, except Air Force Costs at the Air Force Eastern Test Range, were not subjected to internal audit. GAO found that full costs also were not charged at that range. (See pp. 23 and 49.) Internal auditing is an indispensable part of the management process and such audits would improve the accuracy and completeness of cost estimates and billings. (See pp. 28 and 55.)

In view of the requirement contained in negotiated agreements to promptly notify users of substantial increases in costs, procedures should be established for timely review of cost estimates and surcharges to assure accuracy and currency. (See pp. 28 and 55.)

RECOMMENDATIONS

The Administrator of NASA and the Secretary of Defense should:

--Adopt and enforce a policy for recovery of full costs in agreements for all future launches in the absence of evidence, fully documented, to justify a discount.

--Require that cost estimates and billings for reimbursable launches be reviewed by internal auditors to provide greater assurance that they are made in accordance with the agency's policy and procedures and Government laws and regulations, including those which may be established as a result of the findings in this report.

The Secretary of Defense should:

--Establish procedures to provide for documentary support of cost estimates.

--Recompute costs on a full cost basis under foreign military sales agreements for those launches which have not been made, notify the user, and bill the user for such costs where the terms of the agreement permit full cost recovery or attempt to renegotiate the terms of any agreement which restricts full cost recovery.

CHAPTER 1

INTRODUCTION

We reviewed certain costs of satellite launch programs conducted for certain foreign governments, international organizations, and commercial corporations by the Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA). The launch programs were conducted pursuant to agreements negotiated by DOD or NASA, and each launch used services and facilities of both agencies.

DOD has entered into foreign military sales agreements with the United Kingdom (UK) and the North Atlantic Treaty Organization (NATO) to establish defense communications satellite programs. NASA has entered into launching services agreements with the European Space Research Organization (ESRO), the Communications Satellite Corporation (Comsat), Telesat Canada, and others to furnish, on a reimbursable basis, the launch vehicles and launching services for these non-U.S. Government entities to place their satellites in orbit for research and commercial communications purposes.

The following chart identifies some of the satellites launched under the agreements. ESRO's HEOS A2 and TD/1A satellites were launched from the Air Force Western Test Range (AFWTR), and all others were launched from the Air Force Eastern Test Range (AFETR). Thor-Delta launch vehicles were used for all except the Intelsat IV launches for which Atlas/Centaur vehicles were used.

Special Interest Launches and Parties Involved

Name of satellite	Parties involved	Date of launch services agreement	Launch date
Scientific research:			
HEOS A2	NASA/ESRO	June 16, 1970	Jan. 31, 1972
TD/1A	do	June 16, 1970	Mar. 11, 1972
Commercial communications:			
Intelsat IV F-2	NASA/Comsat	Oct. 22, 1969	Jan. 25, 1971
Intelsat IV F-3	do	do	Dec. 19, 1971
Intelsat IV F-4	do	do	Jan. 22, 1972
Intelsat IV F-5	do	do	June 13, 1972
Telesat A	NASA/Telesat Canada	May 10, 1971	Nov. 9, 1972
Telesat B	do	do	Apr. 19, 1973
Defense communications:			
Skynet A	DOD/UK and Air Force/ NASA	Sept. 19, 1966 Aug. 8, 1968	Nov. 21, 1969
Skynet B	do	do	Aug. 19, 1970
NATO A	DOD/NATO and Air Force/ NASA	Sept. 18, 1968 June 5, 1969	Mar. 20, 1970
NATO B	do	do	Feb. 3, 1971

The following chart briefly illustrates the responsibilities of the Air Force and NASA as they relate to the military sales programs and the research and commercial communications programs. The DOD and NASA programs are discussed in further detail below.

MILITARY SALES PROGRAMS	RESEARCH AND COMMERCIAL COMMUNICATIONS PROGRAMS
Sponsors--NATO/UK	Sponsors--ESRO/Comsat/ Telesat Canada (Furnish satellites)
Contractor--DOD Assigned all program management and administration to Air Force	Contractor--NASA Furnish on a reimbursable basis launch vehicles and launching services to place satellites into orbit
Program Manager--Department of the Air Force Design and procure satellite, procure launch vehicle, provide launching services and orbital control	
Assistance by NASA to procure and check out launch vehicle and integrate launch vehicle and satellite	Assistance by Air Force to provide launching services and inject satellite into orbit

DOD FOREIGN MILITARY SALES PROGRAMS

The responsibility for managing and administering the UK and NATO launch programs was assigned to the Air Force Systems Command's Space and Missile Systems Organization (SAMSO), headquartered at the Los Angeles Air Force Station, El Segundo, California. SAMSO was responsible for the design, development, and manufacture of the satellites, as

well as the necessary launching and orbital control services. Under reimbursable agreements negotiated with the Air Force, NASA provided the launch vehicles and most of the launching services required for the support of the UK and NATO programs. In administering the programs, SAMSO was required to monitor and account for total program costs and prepare billings for submission to the Air Force Accounting and Finance Center located in Denver. Based on cost data provided by SAMSO, including NASA costs for the launch vehicles and launching services and AFETR launch support costs, billings for the non-U.S. Government entities are prepared by the Air Force Accounting and Finance Center.

The UK and NATO satellites were designed to have a 5-year service life and to operate in conjunction with the United States Initial Defense Satellite Communications System. The first UK satellite is not operating at full capacity, and the second failed shortly after launch. Both NATO satellites are operable.

The Air Force Satellite Control Facility, a SAMSO component, is responsible for on-orbit tracking, data acquisition, and command and control of all DOD satellites. In accomplishing its mission, the Satellite Control Facility operates and maintains a worldwide satellite command and control network, which was used in support of the UK and NATO launch programs.

AFETR, an organizational component of the Air Force Systems Command, is headquartered at Patrick Air Force Base (AFB), Florida. The range extends from Cape Kennedy, Florida, to the Indian Ocean and includes facilities and equipment for launching and tracking missiles and space vehicles of DOD, NASA, and others. Several contractors assist in the operation and maintenance of the range.

Subsequent to the UK and NATO launchings discussed in this report, DOD entered into follow-on agreements with UK and NATO for additional launchings. Two satellites were to be furnished by the UK for launch during calendar year 1973 and two NATO satellites are to be procured by the Air Force for launch after July 1975. The first of the follow-on UK launches, delayed until January 1974, was unsuccessful.

NASA REIMBURSABLE PROGRAMS

NASA furnishes launch vehicles and support services to ESRO under separate agreements made pursuant to a Memorandum of Understanding, dated December 30, 1966, between ESRO and NASA. ESRO is a consortium of 10 European nations formed in 1964 for space research and technology. Five satellites have been launched since the memorandum of understanding was signed, and at least three more are scheduled to be launched through calendar year 1976. This report considers Air Force and NASA costs for the HEOS A2 and TD/1A launches.

Comsat is a private corporation established under the provisions of the Communications Satellite Act of 1962 (47 U.S.C. 701) to

> "* * * establish, in conjunction and in cooperation with other countries, as expeditiously as practicable a commercial communications satellite system, as part of an improved global communications network * * *."

Representatives of more than 80 nations have joined with Comsat in forming the International Telecommunications Satellite Consortium for the purpose of placing Intelsat communications satellites in orbit for commercial use. Comsat, as the largest investor in the consortium, acts as its manager.

On behalf of the consortium, Comsat has negotiated written agreements with NASA providing that NASA furnish, on a reimbursable basis, the launch vehicles and launching services to place in orbit satellites furnished by Comsat.

Telesat Canada is a corporation which eventually will be owned by the Canadian Government, the Canadian telecommunications common carriers, and the general public. The Telesat Canada satellites are designed to provide Canadian domestic communications from the U.S. border to the Arctic and from the Atlantic to the Pacific.

The launches conducted pursuant to agreements negotiated by NASA used either the Eastern or Western test ranges. Unlike AFETR, AFWTR is not a separate organizational entity.

AFWTR is managed and operated by SAMSO's Space and Missile Test Center, headquartered at Vandenburg AFB, California. AFWTR supports aerospace and related test programs and extends from Vandenburg AFB westward into the Indian Ocean. The facilities and services of AFWTR are equally available to all U.S. Government agencies and to foreign governments and U.S. commercial enterprises when their sponsorship is in the national interest.

NASA's Goddard Space Flight Center located in Greenbelt, Maryland, was responsible for procuring the Thor-Delta launch vehicles used in both the NASA- and DOD-sponsored launches and for providing technical direction over checkout and launch procedures. Goddard is also responsible for preparing most of the information included in NASA's billings for reimbursable Thor-Delta launches, which are prepared at NASA headquarters. NASA's Lewis Research Center located in Cleveland, is responsible for the procurement of Atlas/Centaur vehicles used for Comsat's Intelsat IV launches. Lewis Research Center costs were not included in this review.

The Thor-Delta contractor provided the launch vehicles and launched the vehicles for NASA from AFETR and AFWTR. A number of other contracts have been awarded to support NASA's Delta program. Technical direction of work under the Delta program contracts is under Goddard's Delta Project Office. Goddard exercises technical direction at AFETR and AFWTR through the John F. Kennedy Space Center, Cape Kennedy, Florida. Kennedy accumulates certain costs for both AFETR and AFWTR Thor-Delta reimbursable launches to be included in NASA's billings to Air Force and NASA non-U.S. Government customers.

REFERENCES TO APPLICABLE LEGISLATION AND INSTRUCTIONS

Title V of the Independent Offices Appropriation Act of 1952 (31 U.S.C. 483a), known as the user charges statute, is general in scope and states that it is the sense of the Congress that all services provided to any person (including groups, associations, organizations, etc.), except those engaged in the transaction of the official business of the Government, be self-sustaining to the fullest extent possible and that the fee or charge determined and prescribed therefore by the head of each Federal agency be:

"* * * fair and equitable taking into consideration direct and indirect cost to the Government, value to the recipient, public policy or interest served, and other pertinent facts * * *."

Bureau of the Budget (now Office of Management and Budget) Circular No. A-25, dated September 23, 1959, implementing the user charges statute, states that Federal agencies shall establish fees for special services above and beyond those accruing to the public at large and that the fee computation shall recover the full cost to the Government of rendering the service--including but not limited to salaries, maintenance, depreciation of buildings and equipment, and a proportionate share of the agency's management and supervisory costs. Although the statute and implementing regulations are not inflexible and permit agency heads to establish fees or charges which result in less than full-cost recovery, the general policy provides for recovery of the full costs, if otherwise appropriate.

Section 21 of the Foreign Military Sales Act of 1968 (22 U.S.C. 2761) and its predecessor, section 507(a) of the Foreign Assistance Act of 1961 (22 U.S.C. 2315(a)), authorize the sale of defense articles and services to foreign countries and international organizations provided they agree to pay "not less than the value thereof in United States dollars." The act of 1968 further requires that the procurement of defense articles and services specifically for resale to foreign countries or international organizations be accomplished in such a way that they "pay the full amount * * * which will assure the United States Government against any loss * * *."

The contractual vehicle utilized to define and price each of the individual tasks involved in the UK and NATO launch programs, including those tasks performed by NASA, is a standard DOD form (DD Form 1513) which clearly requires that the Government be reimbursed for all costs and states that the prices quoted are estimates subject to change.

Sections 203(b) (5) and (6) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2473(b)(5) and (6)) provide NASA with authority to enter into contracts, leases, etc., under which the costs to be reimbursed by foreign entities are those as may be agreed to by the parties concerned.

NASA also considers section 205 of the 1958 Space Act (42 U.S.C. 2475) to be relevant in providing launch services to foreign entities.

> "Sec. 205. The Administration, under the foreign policy guidance of the President, may engage in a program of international cooperation in work done pursuant to this Act, and in the peaceful application of the results thereof, pursuant to agreements made by the President with the advice and consent of the Senate."

NASA Policy Directive 8610.5, effective January 12, 1973, sets forth NASA's policy on reimbursement for launch vehicles and other services which are associated with space flights provided to non-U.S. Government users. It states, in part:

> "NASA shall be reimbursed for all reasonable costs and charges related to launch vehicles and other equipment, materials, and services which are associated with space flights and provided pursuant to the terms of contracts or agreements with users."

In May 1966 the President issued a policy memorandum to the heads of all departments and agencies which stated, in part, that:

> "When the Federal Government provides special services for special groups, it is both good economics and good government to charge fees for these services - good economics, because user charges make possible an efficient allocation of resources among alternative programs; - good government, because user charges ensure equitable treatment of the general taxpayer."

In 1971 the United States offered to provide facilities to members of the European Space Conference wishing to put satellites in orbit for peaceful purposes. In October 1972 the President expanded this policy to include all countries and international organizations, consistent with obligations under relevant international arrangements and U.S. laws.

He specified that "Launches will be provided on a non-discriminatory, reimbursable basis."

NASA plans to continue and in fact expand its reimbursable launch programs. A total of 73 Delta launches are planned during the 1974-80 period, of which 34, or 47 percent, will be domestic and foreign reimbursable launches. Of the 34 reimbursable launches, 13 are for foreign entities such as ESRO, NATO, Canada, UK, Japan, Australia, and India and 21 are for domestic communications satellite launches. NASA also plans reimbursable launches for Comsat and for the American Telephone and Telegraph Company using the Atlas-Centaur launch vehicle.

PRIOR REVIEWS

Prior reviews by GAO showed that full costs of materials and services provided to foreign governments and other non-Government activities were not being recovered because:

--The cost of military pay and allowances, utilities, building maintenance, and facility modifications were excluded from charges made for the training of foreign pilots. ("Omission of Significant Costs from Charges to the Federal Republic of Germany for Pilot Training," B-167363, Nov. 19, 1969.)

--Large costs to the Government were not recovered for launch services provided to Comsat by the Air Force for NASA to place commercial communication satellites in orbit. The report was concerned only with Air Force costs and did not include an evaluation of NASA charges to Comsat. The Air Force advised GAO that it would reexamine its billing process and would implement a revised method of accumulating costs for the launch services. ("Large Costs to the Government Not Recovered for Launch Services Provided to the Communications Satellite Corporation," B-168707, Oct. 8, 1971.)

--Administrative costs were inconsistently applied and rates to recover such costs were without adequate foundation. (Letter report to the Director, Defense Security Assistance Agency, July 28, 1972.)

--Charges for the use of Government-owned plant and equipment used to manufacture weapons were excluded from prices to foreign governments. ("Action Needed to Recover Full Costs to the Government of Producing Weapons for Sale to Foreign Governments," B-174901, Sept. 7, 1972.) A letter report to the Secretary of Defense on a followup review showed the same findings to be true 2 years later. (B-174901, Oct. 7, 1974.)

--Large administrative costs and interest on Export-Import Bank loans for arms purchases by Iran were unrecovered. ("Issues Related to U.S. Military Sales and Assistance to Iran" (SECRET), B-133258, Oct. 21, 1974.)

CHAPTER 2

NASA COSTS NOT FULLY RECOVERED

NASA has not identified and does not plan to recover incurred costs which we estimate at about $3 million for assistance to the Air Force on the Skynet A and B launches for UK and the NATO A and B launches for NATO (see exhibit A) and about $1.9 million for the HEOS A2 and TD/1A launches for ESRO. (See p. 18.) The underbillings result chiefly from NASA's decision not to charge for certain indirect costs. NASA advised us that it has changed its procedures for recovery on future launches of some of the types of costs discussed in this report.

It should be recognized that large costs have been incurred under other NASA programs principally for Comsat. In response to our earlier report dealing only with Air Force launch costs incurred for Comsat, NASA's Associate Administrator for Organization and Administration, in a letter dated February 9, 1971, stated that the entire problem of charges made by the Air Force for range support of NASA's reimbursable launches would be reviewed. Since this matter was still under consideration by NASA at the time of our fieldwork for this report, NASA requested that Comsat costs not be included in this review.

Final billings for NASA and Air Force costs have been submitted to the Air Force Accounting and Finance Center for collection of costs on the UK and NATO launches. However, while the Air Force has submitted its final billings to NASA for the HEOS A2 and TD/1A launches, NASA has not yet submitted final billings to ESRO for these launches.

Our review was directed initially to the latest program costs and forecasts available at the time of our fieldwork. Subsequent to the completion of our fieldwork, NASA completed the final billings for the UK and NATO launches, and our cost comparisons have been adjusted accordingly.

We agree substantially with the methods NASA used to charge direct costs to these launches as reflected in its final billings. However, NASA did not identify and charge indirect costs for project management and engineering support

or depreciation costs of these launches. In accordance with its Policy Directive 8610.5, NASA will include a charge in lieu of depreciation in billings for launches made under agreements signed after January 12, 1973. Additionally, according to an attachment to NASA's comments (see app. I), NASA has developed a formula for allocating Goddard, Kennedy, and headquarters indirect costs to Delta launches made under the provisions of the policy directive.

We were informed by NASA officials responsible for the billings that the methods used to determine the final billing amounts for the UK and NATO launches will also be used to determine the final billing amounts for the ESRO launches. Since we agree substantially with the methods NASA used to charge direct costs to the UK and NATO launches, we will limit our discussion of incurred costs in the following sections to indirect expenses, as mentioned above, and the effect these have on computations of additive costs, such as DOD contract administration and overhead and administrative expenses.

NASA has not included in its billings and estimates any charges for interest on the Government's investment or for certain research and development costs, and internal audit of costs of reimbursable launches has been inadequate.

UK AND NATO LAUNCH COSTS NOT FULLY IDENTIFIED

NASA has submitted final billings to the Air Force for the four UK and NATO launches discussed in this report. These billings totaled about $20.1 million compared with our estimates totaling about $23.1 million, representing unbilled costs of about $3 million. NASA's billings to the Air Force, our estimates of NASA's costs on a full cost basis (exclusive of interest on the Government's investment and certain research and development costs), and the differences are summarized in exhibit A and discussed in the following sections of this chapter.

Project management and engineering support

Project management and engineering support includes management, engineering, and administrative services provided

by Goddard's Delta Project Office and Kennedy Space Center's Directorate of Unmanned Launch Operations. NASA's policy has been to include in its billings only the costs of personnel directly supporting each launch, plus certain other direct expenses such as documentation and travel costs. The indirect costs of management and supervisory personnel assigned to these offices and other organizations providing support to these offices were not allocated to the launches. As a result, indirect costs which we estimate at $2,110,000, were not billed for the four launches.

NASA's billing for this cost category and our estimates are shown below. (Also see exhibit A.)

	NASA billing	GAO estimate	Difference
	(000 omitted)		
Goddard direct expenses	$135	$ 135	$ -
Kennedy direct expenses	288	288	-
Goddard indirect expenses	-	882	882
Kennedy indirect expenses	-	1,228	1,228
Total	$423	$2,533	$2,110

As noted above, there are no differences between our estimates and NASA's billing of direct costs. However, NASA did not, and does not intend to, bill indirect costs of this cost category to the reimbursable launches discussed in this report.

To calculate the Goddard indirect expenses allocable to the four UK and NATO launches, we determined the total indirect expenses applicable to the Delta program for fiscal years 1970 and 1972--$1,511,301 and $1,777,217, respectively. Because of the extensive time and effort required, we did not determine the fiscal year 1971 indirect expenses but assumed that there was no increase from fiscal year 1970.

Since Goddard is the project manager for the overall Delta program, its costs should be allocated to all Delta launches. The following table shows the number of launches under the Delta program by fiscal year for each range.

Fiscal year	AFETR	AFWTR	Total
1970	7	1	8
1971	4	2	6
1972	1	3	4
	12	6	18

Therefore, we allocated the fiscal year 1970 costs equally to the 8 launches made during the fiscal year ($188,913 each) and the same assumed costs to the 6 launches made during fiscal year 1971 ($251,884 each). The Skynet A and NATO A launches, therefore, were allocated $188,913 each, and the Skynet B and NATO B launches were allocated $251,884 each, for total Goddard indirect costs of $882,000 for the four launches.

The Goddard Delta Project Manager generally did not take exception to our method of allocating Goddard indirect costs. However, he thought that NASA's own launches should absorb a greater portion of the indirect costs than reimbursable launches. He believed that the indirect costs identified to the Delta program by Delta Project Office personnel may have been overstated because some of the personnel were involved with research and development work and their time should not have been charged to the Delta program. The Delta Project Manager was unable to suggest how we might adjust our computations and allocations.

Kennedy Space Center incurred indirect costs of $1,563,000 applicable to the fiscal year 1970 Delta program at AFETR. Allocation of the costs equally to the 7 Delta launches made from AFETR during fiscal year 1970 results in a charge of $223,286 each to the Skynet A and NATO A launches, for a total of $446,572. Again, because of the extensive time and effort required, we did not identify indirect costs applicable to Kennedy's fiscal year 1971 AFETR Delta program. We assumed that Kennedy's fiscal year 1970 indirect costs of $1,563,000 remained about the same for fiscal year 1971 and apportioned this amount to the four Delta launches made from AFETR during fiscal year 1971. On this basis the Skynet B and NATO B launches would each absorb Kennedy indirect costs of $390,750 for a total of $781,500. The total Kennedy indirect costs for the four launches would be $1,228,000.

Although we allocated these indirect costs on the basis of the number of launches occurring during the period in which the costs were incurred, we do not propose that this method be used in computing final billing amounts. We recognize that other methods, such as a ratio of direct labor-hours, may be more precise and would produce different results. However, the above allocations adequately demonstrate the magnitude of the indirect costs which NASA is absorbing.

Launch services, launch associated services, and other NASA costs

We agree substantially with the method used and the amounts included in NASA's billings for launch services, launch associated services, launch vehicles, propellants, and transportation. We have only minor disagreements with the amounts billed by NASA for these costs, as shown on exhibit A and discussed below.

--Launch services: difference results primarily because we included negotiated prices of certain contract modifications for which NASA assumed the costs were included in the basic contract.

--Launch associated services: we agree with the costs billed by NASA.

--Other NASA costs: we disagree with the method used by NASA to allocate the contract cost underrun and incentive fee in determining launch vehicle costs.

Depreciation

Although NASA's policy has changed to provide for a charge in lieu of depreciation for launches conducted under agreements negotiated after January 12, 1973, NASA's prior policy excluded such a charge on any of the launches discussed in this report. As discussed below, we estimate the unbilled depreciation expense at about $623,000 for the UK and NATO launches. (See also exhibit A.)

NASA real property and equipment used in support of Delta program launches from AFETR were valued at about

$8.4 million for launch complexes, facilities, and buildings and about $4.6 million for equipment. On the basis of a 25-year useful life for real property and a 10-year useful life for equipment, we allocated an annual depreciation charge on the basis of the number of launches from the complex at AFETR as shown below.

Annual depreciation at AFETR

	Value	Useful life	Annual depreciation
Real property	$8,382,499	25 years	$335,300
Equipment	4,579,597	10 years	457,960
Total			$793,260

Allocation per launch

Fiscal year 1970: $793,260 ÷ 7 = $113,323
Fiscal year 1971: $793,260 ÷ 4 = $198,315

The Skynet A and NATO A launches took place during fiscal year 1970, and each should be allocated a charge of $113,323 for depreciation for a total of $226,646. Likewise, the Skynet B and NATO B launches took place during fiscal year 1971, and each should be allocated a charge of $198,315 for depreciation for a total of $396,630. Therefore, the total depreciation charge allocable to the Skynet and NATO launch programs for fiscal years 1970 and 1971 is $623,276.

DOD contract administration

NASA's billings contain amounts for DOD contract administration totaling $116,000 for the UK and NATO launches. However, because our review resulted in variance in the amounts upon which the DOD contract administration cost calculations are based, our estimates of this cost totaled $115,000 for these launches. (See exhibit A.)

NASA's charge to reimbursable launches for DOD contract administration is an allocation of charges levied by DOD upon NASA for such services as audits, quality assurance programs, and inspections at contractor facilities. NASA uses these services and reimburses DOD for them any time a

NASA contract is performed at contractor facilities where DOD personnel monitor production.

In determining the DOD contract administration cost applicable to a reimbursable launch, NASA (1) allocates its total budgeted DOD contract administration cost among the various programs (Delta, Atlas-Centaur, Scout, etc.) in its research and development budget, (2) determines the ratio (expressed as a percentage) of budgeted DOD contract administration costs to budgeted research and development costs for each program, and (3) applies the percentage to the total research and development costs charged to a reimbursable launch to arrive at the DOD contract administration cost applicable to that launch.

Our review did not evaluate the validity of the method used by NASA to develop the percentage and allocate DOD contract administration costs. We therefore applied the percentages developed by NASA to the costs which we determined to be applicable to each launch to arrive at the applicable DOD contract administration costs.

Overhead and administrative expenses

NASA attempts to recover its headquarters overhead and administrative costs associated with reimbursable launches by applying percentage factors to certain launch costs. NASA computed these costs at $279,000 for the UK and NATO launches. Since we estimated higher NASA launch costs, there would be corresponding increases in the overhead and administrative expenses. Our estimate of these costs is $601,000, a difference of $322,000. (See exhibit A.)

NASA applies 15- and 1-percent surcharge rates to certain categories of its launch costs to recover NASA Headquarters overhead and administrative costs and the costs of administering the Delta contracts. The add-ons are not intended to recover the costs of any field centers such as Goddard and Kennedy.

For the NATO and UK launches, NASA applied the 15-percent add-on to Kennedy launch support costs (a portion of the launch associated services cost category), project management and engineering support, and DOD contract administra-

tion. The 1-percent add-on was applied to all other cost factors in the NASA cost estimate.

There were no records at NASA Headquarters to show the rationale for the percentage add-ons or to determine their validity. NASA officials speculated that the percentages were developed in the early 1960s on the basis of estimates by top NASA officials as to what would be a reasonable charge.

Our review did not evaluate the validity of the method used by NASA to develop the percentages and determine overhead and administrative expenses. We therefore applied the percentages developed by NASA to the cost which we determined to be applicable to each launch to arrive at the applicable overhead and administrative costs. As is evident, the difference between NASA's billing for this cost category and our estimate is due primarily to NASA's excluding costs for depreciation and indirect costs of project management and engineering support.

In commenting on our findings, NASA informed us of a recently developed formula for charging indirect costs to Delta launches conducted under agreements negotiated after January 12, 1973. It will include an amount for indirect costs of Goddard, Kennedy, and NASA Headquarters and will replace the 15-percent and 1-percent surcharges previously used to recover NASA Headquarters overhead. We have not attempted to evaluate its adequacy to recover applicable indirect costs on launches subsequent to those reviewed.

ESRO LAUNCH COSTS

Since NASA has not yet determined the final costs to be billed for the HEOS A2 and TD/1A launches, we are unable to compare our estimates of these costs with any substantiated NASA cost determinations. NASA has not revised its cost estimates for the HEOS A2 and TD/1A launches since the agreements were signed in 1970. NASA policy applicable to determining the final costs to be billed for these reimbursable launches provides for the recovery of direct costs plus the 15-percent and 1-percent add-ons for headquarters overhead and administrative expense. We believe that NASA's determination of final direct costs for the HEOS A2 and TD/1A launches will be reasonable if determined in the same manner

as was done for the UK and NATO launches. However, the NASA policy in effect at the time these launches were agreed to did not provide for charging the indirect costs of project management and engineering support or for depreciation. These costs, together with their effect on the computation of additive costs (overhead and administrative), are substantial, as shown below and discussed in the following sections.

Indirect costs of project management and engineering support	$1,485,000
Depreciation	229,000
Overhead and administrative expense	225,000
Total	$1,939,000

Project management and engineering support

The types of services included in project management and engineering support, the types of costs included by NASA in its calculations, and our method of calculating Goddard indirect costs are described on page 12.

The total Goddard indirect costs for fiscal year 1972 were $1,777,217. We prorated this amount to the four Delta launches made during 1972 from both AFETR and AFWTR, which resulted in an allocation of $888,608 ($444,304 each) to the HEOS A2 and TD/1A launches.

Kennedy incurred indirect costs of about $1.5 million applicable to the fiscal year 1972 AFWTR Delta program. For this period, we were able to obtain the total direct hours charged to each launch by Kennedy personnel at AFWTR. Thus, we were able to determine the portion of the costs applicable to the HEOS A2 and TD/1A launches for ESRO on a more precise basis than the more general basis of the number of launches during the period. On the basis of ratios computed by dividing the regular time direct hours charged to each launch by the total regular time direct hours charged to all AFWTR launches, we allocated $397,371 indirect expense to the HEOS A2 launch and $199,008 to the TD/1A launch, or a total of $596,379.

On this basis, the total of Goddard and Kennedy indirect costs applicable to the two launches would be $1,484,987.

Depreciation

As discussed on page 15, NASA plans to include a charge in lieu of depreciation on launches agreed to after January 12, 1973. However, NASA policy at the time of the HEOS A2 and TD/1A launches did not provide for such charges, which we estimate at about $229,000 as shown below, and they will not be included in NASA's final billings for these launches.

At AFWTR, all real property (launch complexes, buildings, and facilities) and the equipment used by contractors in the Delta program are owned by the Air Force (although dedicated to the exclusive use of NASA). The Air Force cost estimates for ESRO's launches from AFWTR include amounts for depreciation of these assets. In addition, however, equipment valued at $4,593,674 is owned and used by NASA for Delta launches at AFWTR. Of this, equipment valued at $4,261,046 is used exclusively for the Delta program (Delta Project Equipment), and other equipment valued at $332,628 is used in support of all NASA/AFWTR launchings regardless of the launch vehicle used (Spacecraft and Institutional Equipment). On the basis of a 10-year useful life, the annual depreciation on this equipment would amount to $426,105 and $33,263, respectively.

We allocated the annual depreciation expense to the ESRO reimbursable launches on the basis of the direct labor hours charged to the launches by NASA personnel at AFWTR. We allocated depreciation expense for Delta Project Equipment on the basis of direct labor charged to the ESRO launches by personnel who work only on Delta programs. However, since the Spacecraft and Institutional Equipment is used on all launches, we allocated depreciation for it on the basis of direct labor charged to the ESRO launches by all NASA personnel at AFWTR. Our calculations are shown below.

HEOS A2 Launch

$$\frac{\text{Annual Depreciation of Delta Project Equipment}}{\text{Total Direct Labor Hours of Delta Personnel}} \times \text{Direct Labor Hours on HEOS A2 by Delta Personnel}$$

$$\frac{\$426,105}{19,559} \times 6252.5 = \$136,215$$

$$\frac{\text{Annual Depreciation of Spacecraft and Institutional Equipment}}{\text{Total Direct Labor Hours}} \times \text{Direct Labor Hours on HEOS A2 by All Personnel}$$

$$\frac{\$33,263}{26,154} \times 8501.5 = \$10,112$$

Total Depreciation for HEOS A2 $147,027

TD/1A Launch

$$\frac{\text{Annual Depreciation of Delta Project Equipment}}{\text{Total Direct Labor Hours of Delta Personnel}} \times \text{Direct Labor Hours on TD/1A by Delta Personnel}$$

$$\frac{\$426,105}{19,559} \times 3471.5 = \$75,629$$

$$\frac{\text{Annual Depreciation of Spacecraft and Institutional Equipment}}{\text{Total Direct Labor Hours}} \times \text{Direct Labor Hours on TD/1A by All Personnel}$$

$$\frac{\$33,263}{26,154} \times 4836.5 = \$6,151$$

Total Depreciation for TD/1A $81,780

Total Depreciation for ESRO Launches $228,807

Facilities maintenance--AFWTR

The NASA estimates of the costs of launching the HEOS A2 and TD/1A launches did not include amounts for maintenance of Delta launch facilities at AFWTR. The Air Force contracted for these services at a cost of $600,000. Therefore, the cost to the six Delta launches conducted at AFWTR during the contract period would be about $100,000 each, or about $200,000 for the HEOS A2 and TD/1A launches.

We brought this matter to the attention of NASA Headquarters personnel and were informed that the final billings for the HEOS A2 and TD/1A launches will include amounts for the maintenance of Delta launch facilities at AFWTR.

Overhead and administrative expenses

NASA's method of determining overhead and administrative expenses applicable to reimbursable launches is discussed on page 17. However, for the HEOS A2 and TD/1A launches, the NASA/ESRO agreements provide for applying the 15-percent rate only to project management and engineering support and DOD contract administration costs. Our inclusion of indirect costs for project management and engineering support ($841,675 for HEOS A2 and $643,312 for TD/1A for a total of $1,484,987) would, at the 15-percent rate, add $222,748 to the charges for these two launches. Additionally, inclusion of depreciation expenses of $228,807 would, at the 1-percent rate, add $2,288 to the charges for overhead and administrative expenses. Therefore, the total additional overhead and administrative expenses applicable to the indirect portion of project management and engineering support and to depreciation expense would be $225,036 for the HEOS A2 and TD/1A launches.

INTEREST AND RESEARCH AND DEVELOPMENT COSTS NOT RECOVERED

Other costs--such as interest on the Government's investment and certain research and development costs--were not included in NASA's charges to reimbursable launches. We did not include these costs in our estimates shown on exhibit A because sufficient documentation was not available to compute such costs. Although these costs were not con-

templated as costs of reimbursable launches by the parties involved, they are costs incident to support of such launches and should be considered in negotiations for future reimbursable launches.

As stated in title 2, chapter 2, section 16.8(e), GAO Manual for Guidance of Federal Agencies:

> "Interest is a cost generally applicable to all Federal Government expenditures. This concept is based on the fact that the Government's disbursements are made from a single pool of funds in the Federal Treasury which are not earmarked as to source or use. If funds disbursed for any given purpose had not been so disbursed, they could have been applied to repay or reduce borrowings, with a consequent savings in interest costs."

In view of the Government's large investment in facilities required to launch satellites, the interest cost is substantial.

NASA has followed a policy of charging a reimbursable launch only for research and development work done specifically for the launch. On future reimbursable launches (those agreed to after January 12, 1973), NASA will expand research and development charges to include that done to improve the reliability or sustain the operational integrity of the launch vehicle used, as well as research and development done to improve the performance of the launch vehicle to meet the users' requirements. However, the NASA policy directive does not provide for prorating research and development costs of major improvements required for NASA programs, even though other users may share the benefits from such efforts.

INTERNAL AUDIT

The NASA Management Audit Office is responsible for ascertaining that financial operations are in compliance with NASA policies and procedures and Government laws and regulations. However, that office, which has representatives

assigned to the various NASA Centers, had not reviewed cost computations for launch support on military sales programs or for the scientific and commercial communications launches.

Subsequent to our fieldwork, the NASA Management Audit Office initiated reviews of costs associated with two specific Delta launch vehicles to meet the requirements of one commercial customer. However, the scope of the initial phase of the audit was limited to assuring that NASA and the contractor possessed adequate accounting systems to segregate the development and unique production costs associated with this specific vehicle improvement.

We were advised by NASA's auditors that future audits are planned which will review costs incurred and billed to users for launch services as well as hardware.

NASA'S COMMENTS AND OUR EVALUATION

NASA's Associate Administrator for Organization and Management commented on our findings in a letter dated October 17, 1974. (See app. I.) Our evaluation of NASA's principal comments follows.

NASA was concerned that our report conveyed suggestions of improprieties. Our report was not and is not intended to convey such an impression. The differences between NASA and GAO discussed in this report revolve around policy and interpretations concerning costs to be reimbursed for satellite launches. We found no indications of impropriety.

NASA states that its present policy is that it shall be reimbursed for all reasonable costs which are associated with space flights and provided pursuant to the terms of contracts or agreements with users. It cites its statutory authority, and discretionary flexibility permitted under the user charges statute, to negotiate agreements which provide for recovery of less than the full cost to the U.S. Government of such programs.

We agree that the agency has the flexibility to establish lower fees or charges. However, the clear intent of the user charges statute and implementing regulations is that full costs should be the standard, if otherwise appropriate.

Also, the clear intent of foreign assistance and sales legislation and Presidential policy statements of May 1966 and October 1972 is to provide for reimbursement of costs incurred.

NASA states that full cost was considered but not adopted, and it cited certain specific factors considered to have benefited U.S. launch programs as a result of reimbursable launch programs. These were increased reliability through added launch crew proficiency and reduced U.S. cost because of an increased number of vehicles produced and a sharing of maintenance costs.

However, NASA was unable to provide documentation to support its consideration of such factors, and no studies had been made to determine the total costs of the launches or the amount NASA was absorbing. It appears that NASA established its charging policies for reimbursable launches without a clear understanding of the full impact of those policies on appropriations for U.S. launch programs. To the extent that any of the factors benefit the launch programs, all participants, both Government and non-Government, would share the benefits.

NASA was critical of the GAO methods of estimating and allocating certain of the unrecovered costs of launch programs.

Since NASA had made no attempt to allocate the indirect costs of launches, NASA's records for the launches we reviewed were not properly constituted to identify and allocate such indirect costs with precision. Nor has NASA proposed any alternative identifications or allocations of these costs, which it considered to be more equitable. However, we did discuss our approaches exhaustively with NASA officials at all levels for the purpose of recognizing in our estimates any specific considerations that they could identify. NASA's criticisms merely serve to obscure the fundamental fact that large costs were not identified and charged to, or recovered from, benefiting non-Government programs. For example:

--NASA objects (see p. 66) to GAO's allocation of project management and engineering support costs on the basis of the number of launches. We recognize and

did indicate as early as our 1971 report to the Congress (see p. 9) that more sophisticated methods (such as a ratio of direct labor hours or dollars) may be more appropriate. However, it was not practicable to apply these methods from the cost records available for the launches covered in this report. The fact remains, uncontested by NASA, that large indirect costs were not allocated by NASA to benefiting reimbursable programs. It is clear that any equitable method of distributing these costs would result in substantially higher charges to benefiting users.

--Also, NASA contends (see p. 66) that the costs of major and minor vehicle improvement programs that were in progress should not be allocated to the launches we reviewed because (presumably) these would benefit future launches. The NASA reply was silent respecting an allocation to these launches of any part of the costs of past vehicle improvement programs.

CONCLUSIONS

NASA's reply to our report on its fiscal year 1969 launches for Comsat enclosed a letter regarding reimbursement of launch costs, in which the Associate Deputy Administrator of NASA stated:

"The goal should be to establish policies and procedures which will enable the United States Government to provide range support services to qualified customers on a basis which does not in fact subsidize commercial or other reimbursable launches * * *."

This had not been achieved for the launches covered in this review, which extended through fiscal year 1972. The estimated costs and final prices of these launches were computed at less than full costs, in accordance with pre-existing agreements. This condition has prevailed for about 10 years.

NASA states that its policy has changed through evolutionary steps which "tend to approach full costs" and that

our findings did not present such changes. By incorporation of the NASA comments into appendix I of our report the NASA position is now covered. We concur with the NASA statement, and we have noted throughout the report that a number of positive steps in this direction have been taken since our previous report on this matter.

However, NASA's comments on our current findings do not indicate that it intends to pursue a policy of full cost recovery for future launches. Under the National Aeronautics and Space Act of 1958 and the user charges statute, NASA feels that it has the prerogative to bill less than the full costs for reimbursable launches. We agree. However, NASA apparently feels (and so does GAO) that if it bills for less than full costs it should have a rationale for doing so. Its rationale is that U.S. launch programs benefit as a result of reimbursable launch programs, and NASA cites improved launch crew proficiency and other items as the benefits.

As stated elsewhere in this report, NASA has not attempted to quantify the benefits received and compare them with value of the difference between the amounts actually billed and the full costs which might have been billed.

When considered in the light of the clear intent of the legislation and the other authorities cited in this report that the Government should recover full costs, we believe NASA's policy of billing charges at less than full costs is highly subjective.

Nevertheless, it may have merit. One could argue that if indeed some benefits accrue to the United States as a result of these launches, simple equity might suggest that the value--or some part thereof--of these benefits should be shared with the recipients of the launch services.

Another view--which is the GAO view--is that the availability of the U.S. space complex even at full costs is an extremely valuable and attractive asset to non-U.S. Government users.

Because of the intent of the statutes and the subjective nature of the NASA policy, we believe that NASA should identify the benefits it believes accrue to the United States

as a result of reimbursable launches, quantify them where possible and compare the value thereof with the difference between full costs and the amount billed the recipients. At a minimum this would assure NASA and others who have an interest that it is getting a fair return from its policy of less than full costing.

The clear intent of the user charges statute and implementing regulations is that full costs should be the standard for establishing charges for reimbursable launch programs, if otherwise appropriate. Also, the clear intent of foreign assistance and sales legislation and Presidential policy statements of May 1966 and October 1972 is to provide for reimbursement of costs incurred. We believe this principle should dominate launch service negotiations, particularly in the present critical budgetary and international balance-of-payments environment and in view of the substantial portion of launches planned for special interests.

It is our opinion that there is no legal basis to require recovery of any unbilled NASA costs for the launches discussed in this report, the recovery of which was not provided for in the launch agreement. However, we believe that full costs should be provided for in agreements for future reimbursable launches in the absence of evidence, fully documented, to justify a discount.

We believe that internal auditing, an indispensable part of the management process, would serve to improve the accuracy and completeness of cost estimates and billings.

In view of the requirement contained in agreements negotiated by NASA to promptly notify users of substantial increases in costs, procedures should be established for timely review of cost estimates and surcharges to assure accuracy and currency.

RECOMMENDATIONS

Accordingly, we recommend that the Administrator of NASA:

--Adopt and enforce a policy for recovery of full costs as described in this report, in agreements for all

future reimbursable launches in the absence of evidence, fully documented, to justify a lesser charge.

--Require that cost estimates and billings for reimbursable launches be reviewed by internal auditors to provide greater assurance that they are made in accordance with NASA policy and procedures and Government laws and regulations, including those which may be established as a result of the findings in this report.

--Establish procedures to provide for timely review of cost estimates and surcharges to assure accuracy and currency.

CHAPTER 3

AIR FORCE COSTS NOT FULLY RECOVERED

Air Force policy provides generally for recovery of all costs incurred in connection with reimbursable launches. The Air Force has increased its efforts to identify costs on a full user charges basis since our review of costs relative to Comsat's earlier Intelsat launches. As a result, the Air Force increased its billings for the UK and NATO launches. These increased billings considered actual costs instead of estimated costs, reclassified certain management and maintenance costs as indirect costs, and treated certain costs which had been capitalized as expenses. Also, billings were increased for omitted military personnel retirement and military pay and allowance costs on the UK and NATO launches when we brought these omissions to its attention.

However, Air Force accounting procedures and cost allocation methods used to determine reimbursable costs did not result in identification and recovery of all incurred costs, which we estimate at about $15.6 million (exclusive of interest on the Government's investment) for the four UK and NATO launches discussed in this report. The Air Force has submitted final billings for these launches of $5.1 million, or $10.5 million less than costs incurred. (See exhibit A.)

The Air Force recomputed the costs incurred for the UK and NATO launches and, although we do not agree that the recomputation recognizes all costs, has determined that the incurred costs substantially exceed the amounts billed. However, the Air Force does not believe that recovery of such costs would be appropriate, and the Department of State agreed on the basis that such recovery would be detrimental to our foreign policy interests.

We also found that the Air Force has not included in its estimates and billings any charges for interest on the Government's investment, that internal audit of costs of reimbursable launches has been inadequate, that there was a lack of documentary support for cost estimates, and that procedures for timely review of cost estimates and surcharges were lacking.

We also noted that charges for Air Force support of subsequent NASA reimbursable launches were being negotiated on a fixed-price basis despite deficiencies in Air Force accounting procedures and cost allocation methods and the uncertainties involved in establishing fixed prices for such a nonstandard event as a satellite launch.

The Air Force recomputed its costs incurred for ESRO's HEOS A2 and TD/1A launches and in March 1973 prepared revised estimates. The revised Air Force estimate for the two launches was $1,702,000, which we believe represents approximately the costs incurred at the time of our review. We were told that the Air Force submitted final billings to NASA for this amount. Therefore, we will not further discuss Air Force costs on these ESRO launches.

AIR FORCE LAUNCH SUPPORT COSTS

Launch support costs include launch complex (direct and indirect), depreciation, and other support costs at AFETR. We estimated that the Air Force incurred costs of about $11.8 million in this category for the UK and NATO launches. However, the AFETR billings totaled only about $3.7 million, or about $8.1 million less than our estimate. The Air Force billings, our estimates, and the differences are summarized in exhibit A and the details are discussed below.

Launch complex direct costs

AFETR billings for the UK and NATO launches were understated by about $864,000 (see exhibit A) because certain Delta program costs were not charged directly to specific launches, nor were they included in the indirect costs allocated to the launches. This occurred because the Air Force did not allocate to launches $2.2 million which it classified as direct costs of the Delta program. Because the Delta program costs benefit all launches, we believe that they should be apportioned to the benefiting user by some equitable method rather than be absorbed by the Air Force.

The range contractor's cost accounting system provides for charging costs to a specific launch when the costs can be identified as directly in support of the launch. On the other hand, routine operation and maintenance costs which benefit all launches from a particular launch complex are charged as direct costs to a general launch program account for that complex. Classifying Delta program costs as direct costs excluded them from the direct charges to the UK and NATO launches and from the indirect cost category for distribution to all launches.

Costs charged to the Delta program account totaled $1,571,501 and $1,066,183 for fiscal years 1970 and 1971, respectively. Apportioning these amounts on the basis of the number of Delta launches occurring at AFETR during those fiscal years (seven and four, respectively) would have resulted in increased allocations of direct costs of $165,358 for each launch in fiscal year 1970 and $266,545 for each launch in fiscal year 1971, for a total of $863,806 to the four UK and NATO launches.

Launch complex indirect costs

Because the Air Force did not allocate the $864,000 direct costs to the UK and NATO launches, the support cost ratio was distorted with the result that the costs of these launches were further understated by $6.3 million in indirect costs--$3.1 million of Air Force support costs and $3.2 million of contractor support costs. (See exhibit A.)

The support cost ratio is used to determine the amount of launch complex indirect costs allocated to each launch. The support cost ratio used at AFETR is a decimal fraction using as a numerator the direct costs incurred for a particular launch and as a denominator the total direct costs of all programs during the fiscal year. Not including part of the Delta program costs in the direct costs of a launch (the numerator) but including the total amount in the total direct costs for all programs (the denominator) reduces the fraction and thus reduces the allocation of indirect costs to a launch.

Consideration of the $864,000 as direct costs of the UK and NATO launches, rather than as general program costs,

in computing the support cost ratio would increase the allocation of indirect costs to these launches by $3,120,482 for Air Force support and $3,225,876 for contractor support. Our computations are shown in the table on page 34.

Depreciation

The UK and NATO billings were also understated because, at the time the agreements for these launches were negotiated, Air Force policy did not provide for including a charge for depreciation of AFETR launch facilities. We estimate the unrecovered depreciation costs amounted to about $680,000 for the four launches. (See exhibit A.)

To compute a charge in lieu of depreciation for fixed price billings (discussed later in this report), the Air Force developed a method for establishing such charges for fiscal year 1973. The Air Force determined that equipment and facilities valued at $412.8 million were subject to depreciation for Delta launches. The Air Force assumed a 10-year life for equipment and a 25-year life for facilities, which resulted in a computed annual depreciation of $29,544,000. To determine depreciation on a per-launch basis, the Air Force divided the annual depreciation by AFETR's total direct costs for the year. This resulted in a rate of 51.61 percent for fiscal year 1973. The depreciation charge for a single launch was determined by multiplying the direct charges for that launch by the depreciation rate.

We did not review the adequacy and accuracy of the method the Air Force used to compute the depreciation charge for fiscal year 1973 because the UK and NATO launches were made in fiscal years 1970 and 1971 and the required data was not readily available for those years. From a cursory review, however, we did find that certain depreciable property had not been included in the Air Force computation. (See p. 47.) Nevertheless, we used the 51.61 percent fiscal year 1973 rate developed by the Air Force for our computation of fiscal years 1970 and 1971 depreciation costs. Although we recognize that our computations are not precise, they indicate the magnitude of the depreciation costs excluded from the Air Force billings based on the Air Force method for computing this cost.

	SKYNET		NATO		
	A	B	A	B	Total
1. Contractor direct cost					
Billed by Air Force	$ 89,614	$105,260	$117,935	$140,596	$453,405
GAO adjustment	165,358	266,545	165,358	266,545	863,806
Subtotal	254,972	371,805	283,293	407,141	1,317,211
Less Air Force direct cost (computer rental)	-7,606	-3,445	-3,684	-1,841	-16,576
Total	$247,366	$368,360	$279,609	$405,300	$1,300,635
2. Contractor direct cost "all programs"	$20,184,151	$18,320,669	$20,184,151	$18,320,669	
3. Support cost ratio (line 1 ÷ line 2)	.012255456	.020106252	.013852898	.022122554	
4. Air Force indirect cost pool	$70,926,268	$67,302,854	$70,926,268	$67,302,854	
Billed by Air Force	$288,173	$374,028	$401,473	$509,731	$1,573,405
GAO adjustment	581,061	979,180	581,061	979,180	3,120,482
Total (line 3 x line 4)	$869,234	$1,353,208	$982,534	$1,488,911	$4,693,887
5. Contractor indirect cost pool	$80,324,019	$65,633,021	$80,324,019	$65,633,021	
Billed by Air Force	$326,356	$364,748	$454,669	$497,084	$1,642,857
GAO adjustment	658,052	954,886	658,052	954,886	3,225,876
Total (line 5 x line 3)	$984,408	$1,319,634	$1,112,721	$1,451,970	$4,868,733

Using the 51.61 percent rate and multiplying this rate by the direct costs we determined to be applicable to each UK and NATO launch as described previously, we computed a total depreciation charge for the four launches of $679,813 as follows:

	Skynet		NATO		
	A	B	A	B	Total
Total direct charges	$254,972	$371,805	$283,293	$407,141	$1,317,211
Depreciation rate	.5161	.5161	.5161	.5161	.5161
Depreciation charge	$131,591	$191,889	$146,208	$210,125	$ 679,813

The Air Force now considers depreciation a proper charge for inclusion in reimbursable billings and has included a charge for use of facilities in its billing for Comsat's Intelsat IV launches.

Other support costs

Air Force billings for UK and NATO launches were understated by about $184,000 because indirect costs for non-Air Force tenants and military retirement were not considered. The details concerning this category of costs are discussed below and summarized in exhibit A.

Operating costs for certain non-Air Force organizations which are tenants at Patrick AFB and which support AFETR were not considered in the UK and NATO launch cost computations, although they represent indirect costs of range operations. These organizations which support the range and contribute to its operation, and their costs, are shown below.

Non-Air Force tenant	FY 1970 cost	FY 1971 cost
U.S. Army Port Canaveral	$ 585,000	$ 620,000
U.S. Navy MSC Resident Office	130,000	150,000
Defense Contract Audit Agency	110,000	110,000
Federal Aviation Agency	135,000	135,000
U.S. Public Health Service	10,000	10,000
Bureau of Customs and Agriculture	35,000	35,000
	$1,005,000	$1,060,000

The Resident Auditor, Air Force Audit Agency, said that he had questioned the omission of non-Air Force tenant costs from AFETR's billings for special interest launches. He said that higher authority had decided that non-Air Force tenant costs would not be included in the billings and that the matter had been dropped. It should be noted, however, that such costs have been included in computing charges for support of the subsequent Intelsat IV launches.

The Air Force did not include military retirement costs in its estimates for UK and NATO launches. When we brought this oversight to its attention, the Air Force increased its billings by $72,040 by application of its support cost ratio. As discussed on page 31, however, this ratio was not properly computed.

Since both non-Air Force tenant costs and military retirement costs are indirect costs and since they were not included in the Air Force or contractor indirect cost pools, we used our revised support costs ratio to allocate these costs. As a result, the Air Force billings are understated by about $71,000 for non-Air Force tenant costs and by about $113,000 for military retirement costs, or a total of $184,000, as shown on page 37.

ORBITAL SUPPORT SERVICES

The Air Force included in its billings a total of $523,000 for orbital support services. Our estimates total $2,098,000, or $1,575,000 more than the Air Force billings. (See exhibit A.)

	SKYNET		NATO		
	A	B	A	B	Total
Military retirement costs	$2,610,957	$2,777,404	$2,610,957	$2,777,404	
Support cost ratio per GAO	.012255456	.020106252	.013852898	.022122554	
Allocation	$31,998	$55,843	$36,169	$61,443	$185,453
Less: billed by Air Force	-12,399	-17,931	-17,274	-24,436	-72,040
Understated retirement cost	$19,599	$37,912	$18,895	$37,007	$113,413
Non-Air Force Tenant Costs	$1,005,000	$1,060,000	$1,005,000	$1,060,000	
Support cost ratio per GAO	.012255456	.020106252	.013852898	.022122554	
Allocation	$12,317	$21,313	$13,922	$23,450	71,002
					$184,415

The Memorandums of Understanding for both the UK and NATO programs provide for the United States to supply satellite tracking and control effort for each launch. SAMSO's Satellite Test Center and several remote tracking stations were used in providing the orbital control services.

The United States-UK agreement provided that the UK would pay the United States $100,000 per satellite for the tracking and control effort necessary to place them in orbit, and that, thereafter, the UK would pay $20,000 a year for the United States to maintain a backup capability and $3,000 a month when the UK required the United States to track and control the satellite.

SAMSO officials said that documentation was not retained to show how the $100,000 fee was determined in 1966 but that it covered (1) the integration and test of the satellite contractor's computer program for the ground and other control functions, (2) the development of the program used by the tracking station to send commands to the satellite, and (3) the tracking and command services necessary to place the satellite into a stationary orbit.

Similarly, SAMSO did not have supporting documentation for the backup fees negotiated with the UK in 1970. SAMSO officials said that the $20,000 fee was based on the estimated cost of 9 staff-months of effort at the test center and that the $3,000 monthly fee was a proportionate share of the cost to operate and maintain selected equipment.

The United States-NATO agreement provided that NATO would pay the United States $100,000 per satellite for the tracking and control effort for the first year. The agreement also provided that NATO would pay the United States $20,000 a year to maintain a capability to track the satellites and $35,000 a year for actual tracking and command of the satellites. We were advised that the estimates developed for the UK satellite program were also used for the NATO program and that thus there was no documentation to support these estimates.

SAMSO had not maintained records which would enable it to test the accuracy of its orbital support cost estimates or to compile the actual or estimated cost of the services

performed. In the absence of such information, we estimated the cost on the basis of operational support hours used by the test center and the tracking stations in support of these launches. Using this method, we estimate that Air Force costs through June 30, 1972, exceeded the amounts subsequently billed as follows:

	Launches		
	UK	NATO	Total
	(000 omitted)		
Initial effort	$361	$1,043	$1,404
Follow-on effort	236	458	694
GAO estimates	597	1,501	2,098
Air Force billings	-254	-269	-523
Underestimated	$343	$1,232	$1,575

Since this effort continued after our review, additional costs have been incurred that are not included in our estimates.

The United States and the UK have entered into an agreement for a follow-on Skynet program which provides that the tracking and control effort for two satellites until their turnover to the UK, will cost $430,000. SAMSO advised us that it was also using this estimate for an upcoming NATO program.

SAMSO developed a cost model for allocating direct and indirect orbital support costs for the upcoming UK and NATO programs on the basis of operational costs per hour and assumed that the tracking stations and test center operate 24 hours a day. This method had not been approved by Air Force headquarters at the time of our review.

The SAMSO model was predicated on achieving a rate which would be attractive to non-DOD users in order to encourage their continued use of the Satellite Control Facility. According to SAMSO, its support to UK and NATO does not infringe upon or degrade the facility's support to its primary programs.

The SAMSO approach reduced reimbursable hourly rates of low-priority users by about 50 percent on the assumption

that high-priority users should absorb the cost of any non-operational time--about 12 hours a day.

SAMSO's model does not provide for recovering indirect costs for nonoperational time of tracking stations, although recovery is required under a full cost recovery policy. In addition, the cost model does not include a share of SAMSO's command and functional staff costs or depreciation on facilities and equipment at tracking stations.

PROGRAM ADMINISTRATION AND MANAGEMENT

Administrative charges were inadequate to recover DOD's costs of administering and managing the UK and NATO satellite programs. We estimate that SAMSO costs of such effort exceeded the billings by about $841,000. (See exhibit A.) Other DOD and Air Force organizations were involved in administering and managing these programs, and their costs were not recovered. We did not attempt to estimate these additional costs.

As program manager for the UK program, SAMSO was responsible for:

1. Managing and procuring the design and development of two synchronous communications satellites from a U.S. contractor.

2. Managing and procuring the design development integration and installation of a Telemetry-Command Complex at a facility in the U.K.

3. Procuring the launch vehicles and launch services.

4. Managing the launch and placement of the satellites on-station.

5. Providing backup orbital control services.

For the NATO program, SAMSO was responsible for functions 1, 3, and 4; telemetry and command capability for full space subsystem control; and station-keeping and operational control of the satellites throughout their life.

DOD policy and Air Force regulations concerning foreign military sales pricing require that an administrative charge, at an established rate, be added to the prices of contractual services and procurements from new production. The charge is intended to provide reimbursement for DOD's cost of administering and managing foreign military sales programs. However, DOD policy states that, if the supplying military department determines the rate to be insufficient, the estimated or actual costs could be used instead of the established rate. From December 1, 1965, through June 30, 1967, DOD authorized an administrative charge on sales of material and contractual services of 5 percent on the first $1 million and 1-1/2 percent on the balance. DOD changed the administrative surcharge to 2 percent beginning July 1, 1967.

The Air Force billings provide for recovery of $420,348 for the UK launches and $413,921 for the NATO launches.

Records were generally not available to enable SAMSO to evaluate the adequacy of the surcharge or to compile the actual or estimated program management and administrative costs. In the absence of necessary information, we prepared estimates of the costs incurred for their effort. We based our estimates, in part, on discussions with SAMSO program office personnel and on estimates, prepared at our request, of manpower used in managing the UK and NATO programs. We also used certain cost data from SAMSO's accounting records.

We estimate that SAMSO's cost of managing and administering the programs for fiscal years 1967-71 was about $1,675,000. We do not consider our estimate of the cost incurred by SAMSO in managing and administering the programs to be precise. However, comparing our incomplete estimate with the amount billed shows that there will be a substantial unrecovered cost to the Government.

DOD and various other Air Force organizations also incurred management and administrative expenses in support of these non-Government satellite programs. Although we did not attempt to estimate the cost of these additional efforts, they are part of the cost recoverable through applying the administrative surcharge. These organizations included:

1. DOD--the Assistant Secretary of Defense (International Security Affairs).

2. Air Force--the Space Directorate, Deputy Chief of Staff for Research and Development, and the Office of Military Sales and Assistance.

3. Headquarters, Air Force Systems Command--the Directorate for Ballistic Missiles and Space Systems, Deputy Chief of Staff (Systems).

4. Air Force Accounting and Finance Center.

Although SAMSO officials generally agreed with our estimate of SAMSO's cost of managing and administering the UK and NATO satellite programs, they contended that the programs did not impose additional overhead expenses upon the Air Force. Even if the programs did not exist, Air Force command and staff elements and facilities used in support of foreign programs would still be required to accomplish their assigned DOD mission. They contend that, since no additional costs were incurred, there should be no charge for these services. This contention ignores the stated Air Force policy to compute charges on a full cost basis.

Air Force Headquarters officials assigned to the Military Sales and Assistance Office said that the administrative surcharge rate included in the UK and NATO agreements was in accordance with DOD policy and that they did not determine the adequacy of the rate to recover all administrative costs. However, Air Force instructions implementing DOD's foreign military sales policy provide that, when the Air Force procures nonstandard items[1] on behalf of a foreign customer, a charge of 5 percent of the contract or production cost will be made instead of the 2 percent. Although SAMSO told us that the UK and NATO satellite procurements met the definition of a nonstandard item, they said that these programs did not require any more effort than do other communications satellite programs SAMSO administered.

[1]Not included in the Air Force inventory nor procured for regular use by the Air Force.

The Auditor General of the Air Force also questioned the adequacy of the administrative surcharge rates to recover full costs. In a June 1971 report, he identified approximately $10 million of general and administrative expenses of which about $6 million was reimbursed. The Auditor General reported that there were no indications that such factors as communications, depreciation, office floorspace, utilities, office supplies, Military Assistance Advisory Group operating expense, or a share of DOD foreign military sales expenses had been considered in establishing the surcharge rate.

The follow-on NATO Memorandum of Agreement signed in July 1972 specifies the 2-percent surcharge rate. In October 1971 SAMSO proposed to Air Force Headquarters that the rate be increased to 4 percent. The increase was not approved, but SAMSO direct manpower costs of about $2.2 million will be recovered as a separate element of program cost. About $1.25 million will be recovered by using the 2-percent surcharge.

Thus, the new procedure will result in recovering much more of the cost than was recovered under the prior UK and NATO programs. However, we believe that it will not recover all such expenses. SAMSO's October 1971 request for the surcharge rate increase did not include an amount for SAMSO's overhead or depreciation or for costs which DOD and certain other Air Force organizations incurred. These amounts would be significant. For example, we estimate that SAMSO's overhead alone will be more than $1 million.

INTEREST AND RESEARCH AND DEVELOPMENT COSTS NOT RECOVERED

We previously discussed the interest and research and development costs applicable to NASA operations. Such costs were also incurred by the Air Force and were not, except for research and development costs, charged to reimbursable launches. DOD's agreements with the UK and NATO provide that past research and development costs of $800,000 be reimbursed under each program and such costs were billed. These costs are not shown in exhibit A.

FIXED PRICES FOR AIR FORCE COSTS OF INTELSAT IV AND TELESAT CANADA LAUNCHES

The agreements between NASA and Comsat for the Intelsat IV launches and between NASA and Telesat Canada for the Telesat launches include estimates of the Air Force portion of the costs to support the launches. The agreements also provide that the Air Force may revise its method of calculating costs and that such revised costs are subject to further negotiations between NASA and Comsat and between NASA and Telesat Canada.

In January 1973, NASA and the Air Force negotiated a $2 million fixed price for Air Force range services for each of the first six Intelsat IV launches. At that time, the first four satellites had already been launched. Subsequently, NASA initiated action to incorporate this fixed price in its agreement with Comsat. AFETR estimated its range services cost at $1.4 million for each of two Telesat Canada launchings made during fiscal year 1973. NASA had not, at the time of our review, reached agreement with the Air Force for a fixed price for these launches. These rates are based on AFETR's job order cost accounting system, which the Air Force agrees is deficient, and may not recover all AFETR launch costs.

AFETR's accounting system data had not been used previously to establish launch service reimbursable costs because the system did not collect all necessary data for full user charges. Instead, billings for reimbursable launchings have been based on data from AFETR allotment records, range contractor cost reports, and similar sources. As noted in the previous sections of this chapter, we found serious deficiencies in this method also.

The Air Force Audit Agency audited AFETR's job order cost accounting system data and concluded in its June 21, 1972, report:

> "We believe that improvements are needed in the systems and procedures used to account for Air Force costs before (job order cost accounting system) data can be used as a reliable base to determine fixed charges for 'full-user' launches."

Despite the deficiencies in the job order cost accounting system and the unreliability of the data derived from it, the Air Force chose to use this data to compute fixed rate billings for range services associated with the Intelsat IV and Telesat Canada launches.

An official of the Office of the Deputy Assistant Comptroller for Accounting and Finance, Headquarters, Air Force, said that the task group had based the Intelsat IV fixed price charges on job order cost accounting system data for the following reasons.

--It was at least a system and would provide an auditable trail, even though it contained deficiencies which could affect the accuracy of any computation based on the data.

--The time for negotiating the Intelsat IV fixed price billing rate with NASA required that system deficiencies be corrected by July 1, 1971. There was not time for further refinement or purification beyond that date, at least insofar as initial negotiations with NASA were concerned.

Pricing of Intelsat IV launches

A task group composed of Air Force Headquarters and Air Force Systems Command representatives was organized to devise a practical method of computing fixed price estimates of AFETR costs. On April 8, 1971, using the job order cost accounting system, the task group proposed a fixed price of $2,868,196 for fiscal year 1973 Atlas/Centaur launches. Six Intelsat IV launches using the Atlas/Centaur launch vehicle were scheduled to be made through May 1973.

In October 1971 Air Force and NASA representatives met to begin negotiations for a fixed price rate for Air Force costs in support of Intelsat IV launches. Following this meeting, an Air Force task group and NASA personnel made further reviews and analyses of launch support costs. The reviews resulted in a $2,068,286 proposed billing rate which was recommended in a June 30, 1972, Air Force task group report. In September 1972 the proposed rate was increased to $2,093,113 to include military retirement costs. Air

Force-NASA negotiations were concluded in January 1973 when a $2 million fee for AFETR Intelsat IV range services was agreed upon.

An official of the Office of the Deputy Assistant Comptroller for Accounting and Finance, Headquarters, Air Force, said that the $2 million rate was based on judgment and that there was no record of negotiations showing what weight or costs, additions, or reductions were allowed for inflation, AFETR accounting system deficiencies, or other factors which could influence range services costs.

The Air Force task group estimates were as follows:

	April 8, 1971	June 30, 1972
Direct costs	$ 322,234	$ 319,167
Complex costs (note a)	157,325	211,407
Mission operation support	3,577	3,194
Overhead	1,846,442	1,262,921
Depreciation	538,618	271,597
	$2,868,196	[b]$2,068,286

[a]Apportioned on the basis of the number of Atlas/Centaur launches during fiscal year 1971.

[b]Increased by $24,827 in September 1972 to include military retirement cost.

The primary differences between the two task group estimates were the allocations to overhead and depreciation. Overhead allocations were lower in the second estimate due to reclassifying general mission costs of about $18.3 million as direct costs on the basis that they provided no benefit to special interest launches. Depreciation was reduced as a result of a $218.6 million reduction in AFETR depreciable property which was not considered to be required for special interest launches.

Under the methodology adopted by the task group, classifying costs as direct or general mission has a significant effect on the amount to be charged to a launch. General mission, or overhead, costs for a particular launch are determined individually for the range contractor, photographic

services contractor, and the Air Force. Each contractor's total general mission cost is divided by its total direct costs to arrive at a ratio. General mission costs are then allocated to a particular launch on the basis of direct costs charged to a launch multiplied by the ratio. The Air Force general mission cost ratio is determined by dividing its total general mission costs by the sum of Air Force, range contractor, and photographic services contractor direct costs. The resulting ratio is then applied to Air Force direct costs charged to a particular launch to determine the amount of Air Force general mission costs to be allocated.

We did not attempt to review all elements of the task group's estimates, nor did we analyze the rationale for its allocations. However, from a cursory examination of support and depreciation costs the task group included in its June 30, 1972, estimate, we noted some omissions and misclassifications resulting in understated amounts for these cost elements.

Support costs classified as direct costs:

--$221,428 for Air Force and range contractor support of U.S. Public Health Service, Military Sea Transport Service, and U.S. Army Cape Kennedy Outpost Operations. These activities supported range operations.

--$175,500 operating cost of Military Sealift Command, an AFETR tenant organization which scheduled shipments of supplies to downrange stations.

--$84,993 support costs for range contractor crews at Malabar and Cape Canaveral, Florida. The Malabar communications site supported all AFETR launches and the Cape Canveral site supported range cargo ships.

Omitted support costs:

--$1,170,000 second-destination transportation costs to deliver supplies and materials to AFETR.

Omitted AFETR depreciable property:

--$2.5 million cost of an H-53 helicopter used in support

of AFETR unmanned launches was omitted from AFETR's depreciable facilities and equipment.

As a result of the above misclassifications and omissions, the amounts of overhead and depreciation included in the task group's final estimates were understated by $38,916, and $2,200, respectively. Headquarters, Air Force, and AFETR Comptroller Office officials generally agreed with our findings concerning the misclassification and omissions.

Pricing of Telesat Canada launches

Using job order cost accounting system data and the same methodology followed by the task group in computing the Intelsat IV fixed price estimate, AFETR computed $1,436,781 in August 1972 as the cost of each of two Telesat Canada launches. These launches were scheduled to be made during fiscal year 1973 using Thor-Delta launch vehicles.

AFETR's estimate was almost double the estimates contained in the NASA-Telesat Canada launch services agreements for the launches because the task group costing method (1) increased direct and overhead costs and (2) allocated complex, mission operation support and depreciation costs--which had not been allocated as costs under the previous method--as shown below.

	Estimate for each launch computed by AFETR on the basis of Air Force task group methodology	Estimates contained in NASA-Telesat Canada launch services agreements	
		Telesat Canada A	Telesat Canada B
Direct costs	$ 135,511	$ 99,450	$ 92,200
Complex costs	252,034	-	-
Mission operation support	4,097	-	-
Overhead	843,013	725,386	670,604
Depreciation	202,126	-	-
Total	$1,436,781	$824,836	$762,804

Overhead and depreciation charges for the Telesat Canada estimate were computed in the same manner as the Intelsat IV estimate. Thus, the misclassifications and omissions of costs also apply to this estimate.

AFETR's Telesat Canada estimate was further understated by $43,579 because certain range contractor direct costs applicable to a fiscal year 1971 reimbursable launch were considered to be Delta program costs. However, the costs were not added to the Delta program account. AFETR's Chief of Special Projects, Comptroller's Office, said that, if the Telesat Canada proposed billing rate was used, he would recompute the billing to correct for this error.

AFETR's estimate was further understated because it did not include any costs for AFETR aircraft support. NASA had previously advised the AFETR that Thor-Delta aircraft support was a NASA requirement rather than a mission requirement and that NASA should absorb such costs. However, an official of NASA Headquarters' Directorate of Launch Vehicle and Propulsion Programs stated that AFETR aircraft support for the Telesat Canada launches was a mission requirement and that the costs would be billed to Telesat Canada. AFETR aircraft support costs for a prior reimbursable Thor-Delta launch was estimated at about $26,000. An Air Force Headquarters official stated that, when the Telesat Canada fixed rate billing is negotiated with NASA, the aircraft support would be included in the estimate.

INTERNAL AUDIT

AFWTR, AFETR, SAMSO, and SAMSO's Satellite Control Facility incurred Air Force launch costs for the launches discussed in this report. Only AFETR's costs have been audited and evaluated by internal auditors to ensure their accuracy and conformance to existing regulations and instructions. Even there we found that full costs had not been identified.

On September 24, 1968, an Assistant Secretary of the Air Force requested the Air Force Auditor General (now the Air Force Audit Agency) to audit each billing to be submitted by AFETR for support furnished non-U.S. Government organizations using the range to launch orbiting satellites. Accordingly,

the Air Force Audit Agency has examined AFETR's UK and NATO billings and has requested Defense Contract Audit Agency verification of range contractor costs in the process.

However, similar audits have not been required or made of AFWTR, SAMSO, and Satellite Control Facility costs incurred for the UK, NATO, and ESRO launches. The fixed price billing amounts negotiated for the Intelsat IV launches and the estimates for the Telesat Canada program have not been internally audited.

Although we found that full user charges cost at AFETR had not been identified, as noted in previous sections of this chapter, the Resident Auditor said that the costs included in AFETR's reimbursable billings were correct, based on AFETR's own rationale and ground rules as to what costs should be considered as direct and support. However, he had been unsuccessful in determining the rationale that the task group (which computed the fixed price estimates) used to classify costs as direct or support.

An Air Force Headquarters official said that the Air Force Audit Agency had not been requested to review the task group's computation of the Intelsat IV fixed price computation because one of the members of the task group was an employee of the Air Force Audit Agency. However, he agreed that perhaps the agency should have been requested to review the computations.

DOD AND DEPARTMENT OF STATE COMMENTS AND OUR EVALUATION

We brought our findings to the attention of DOD and the Department of State on May 9, 1974.

DOD comments

The Assistant Secretary of the Air Force (Financial Management), replying for the Secretary of Defense, submitted comments in a letter dated July 23, 1974. (See app. II.) Our evaluation of his principal comments follows.

The Air Force agreed that full user charges should be used in costing special interest launches, that documentary

support of cost estimates needs improvement, and, in concurrence with the Secretary of Defense, that periodic reviews are required to assure accuracy and currency of estimates and surcharges.

The Air Force recomputed UK and NATO costs on what it considered to be a full cost basis which totaled $6.2 million less than our estimate. (See p. 78.) This computation used the same method as was used to compute fixed prices for certain other reimbursable launches. It limited the costs for certain services because the NATO agreement contained such limitations. Consequently, the revised Air Force computation is, in our view, substantially understated. We have shown the Air Force task group's computation to be inadequate; we believe that the provision of the NATO agreement limiting chargeable costs in certain categories is contrary to the requirements of foreign military sales legislation that "not less than the value" be recovered.

Although the Air Force agreed that its billings to the UK and NATO were not on a full user charges basis, it contended that revised billings based on a full cost approach (even though much less than the amount estimated by GAO) would not be appropriate because (1) the UK and NATO could reasonably expect the final price to be computed in accordance with procedures used in establishing the original estimates, (2) the magnitude of cost increases reasonably to be expected by the users was on the order of 10 percent rather than 150 to over 300 percent, (3) the increases, caused by a change in allocation policy rather than change in scope of effort, would preclude, at this late date, the user's option of terminating the agreement before excessive costs were incurred, (4) there would be an adverse impact on the cooperative satellite communications programs with our allies, and (5) it would not be in the best interests of good international relations.

In view of the language of foreign assistance and sales legislation referring to payments at "not less than the value thereof," it is our opinion that, in general, all costs of providing services under the legislation should be reimbursed and that any questions as to what constitutes a cost should be resolved in favor of the United States. Further, the agreements negotiated by DOD with the UK and NATO provide for

notifying the UK and NATO when cost increases became apparent so that progress payments can be increased. DOD should have determined the costs of these launches on a full cost basis and promptly notified the UK and NATO.

The Air Force agreed that there were problems in the use of fixed price arrangements. The Air Force proposed to accommodate these problems by the use of special fixed price arrangements such as:

--Providing for additional cost recovery where any change in launch services results in a cost increase in excess of 10 percent.

--Providing separate fixed prices for significant special Air Force services.

--Including a factor, based on historical experience, to cover the average costs for weather delays, equipment failures, and other reasons.

--Avoiding widely fluctuating prices by averaging costs over 2 or more years.

We agree that fixed prices could be appropriate where accurate historical cost data and adequate procedures for accurate cost projection are available. Such is not the case at the present time, however. (See our description of the fixed prices developed for Intelsat IV and Telesat Canada launches beginning on p. 44.) We agree that user charges need not be supported by formal cost accounting systems where such systems would be economically or technically infeasible to maintain, that many aspects of the billing process become a "cost finding" exercise, and that alternative approaches can be taken in computing costs. We also agree that averaging costs over a period of years could be appropriate, provided that all costs and all launches were included and reflected the "average" costs for the various services provided. However, in the absence of accurate historical costs and procedures for accurate cost projection, use of fixed prices becomes a highly conjectural exercise with no assurance that prices will reflect costs in such a massive, lengthy, and complex undertaking. This is especially true since support of a satellite launch involves considerable uncertainties, as described by the Air Force.

The Air Force stated that internal audit of estimates and billings for all reimbursable launches was not appropriate. The Air Force added that managers will request the Air Force Audit Agency to provide assistance, on a special request basis, whenever it is concluded that the Air Force Audit Agency has special expertise which may be useful in costing special interest launches.

We agree that internal audit of all estimates and billings is not necessary. We also agree that it is management's responsibility to ensure that its controls over the billing process are adequate and that it is the auditor's responsibility to objectively appraise the effectiveness and efficiency of management controls. However, we believe that the internal auditors should themselves initiate the selection of areas to be reviewed. The internal audit function provides managers with an additional incentive to ensure that billings for special interest launches include the full costs of performing those launches. Restricting the auditors' activities to those performed on a "special request basis" may also have the effect of restricting that incentive.

Department of State comments

The Department of State commented on our findings in a letter dated August 16, 1974. (See app. III.) The State Department believes it would be detrimental to our foreign policy interests to reopen negotiations for reimbursement in any instance where agreement has been reached and confirmed by the participating entities and particularly objects to retroactive recovery of user charges at this late date.

The Department contended that, although each launch agreement involved negotiated estimates of cost and some minor adjustments in final billings can be made, a subsequent claim of the magnitude suggested by GAO would cast serious doubt on the good faith of our country. Therefore, the Department believes, irrespective of legal or accounting justifications, that this matter should be closed on completed launches or on those for which contracts have been completed.

The Department believes that until NASA and DOD can establish accounting systems whereby full user charges can be clearly defined in advance of negotiations, any attempt to apply retroactive charges will probably lead to an inequitable and discriminatory result. This would not be in keeping with the President's policy statement of October 1972. A significant increase, billed retroactively, would certainly discourage international cooperation and weaken our role as leader in the international venture of space exploration.

Although the President's policy statement of October 1972 provided for nondiscriminatory use of U.S. facilities, the statement also provides for such use on a reimbursable basis. We interpret this to mean full cost.

If the items we questioned had been included in developing billings to foreign entities, the bills for launching services would have been increased by about $10 million. However, (1) the bills have been presented to and paid with a presumption of finality by the foreign entities, (2) no effective legal mechanism exists for retroactive recovery of the questioned costs, and (3) the current cost accumulation and billing practices of the agencies should improve the situation for future launches. We therefore are not recommending retroactive recovery of unrecovered costs for those launches already made.

CONCLUSIONS

Our conclusions concerning NASA's costs for reimbursable launches (see pp. 24 to 28) are in general applicable to Air Force costs for such launches. Furthermore, we believe that DOD should recompute costs on a full cost basis for those foreign military sales launches which have not been made, notify the user, and bill the user for such costs where the terms of the agreement permit full cost recovery or attempt to renegotiate the terms of any agreement which restricts full cost recovery.

We believe that a contributing factor in the Air Force underestimates of cost was a lack of procedures for identifying costs to supporting documentation. We believe the percentage surcharge for program administration and management costs is not adequate because our review showed that SAMSO costs alone exceeded Air Force estimates and because costs of

other organizations that contribute to and incur costs for this support were not included in our review. We believe that procedures should be established for periodic review of estimates and surcharges to assure accuracy and currency.

Our conclusions with respect to (1) our methods of estimating and allocating costs, (2) internal auditing, and (3) timely review of estimates and surcharges, in the case of NASA costs (see p. 26), also apply to the Air Force.

We believe that the agreements with users of the Air Force ranges who are to reimburse the Air Force should clearly stipulate that final billings will be based upon actual costs incurred.

Because launch services--and therefore costs incurred--can vary substantially depending on such uncertainties as equipment performance or weather delays, we believe that fixed prices cannot be accurately determined in advance for such sophisticated products as launch services. Furthermore, we believe it highly probable that the establishment of a fixed price as much as 2 or more years in advance of a launch would, because of inflation and other unknowns, tend to be understated and fail to recover the full costs of the launch.

Although the Air Force policy generally is to recover all costs of reimbursable launches, this has not been achieved.

RECOMMENDATIONS

Accordingly, we recommend that the Secretary of Defense:

--Adopt and enforce a policy for recovery of full costs, as described in this report, in agreements for all future reimbursable launches in the absence of evidence, fully documented, to justify a discount.

--Require that cost estimates and billings for reimbursable launches be reviewed by internal auditors to provide greater assurance that they are made in accordance with DOD policies and procedures and Government laws and regulations, including those which may be established as a result of the findings in this report.

--Establish procedures to provide for documentary support of cost estimates.

--Recompute costs on a full cost basis under foreign military sales agreements for those launches which have not been made, notify the user, and bill the user for such costs where the terms of the agreement permit full cost recovery or attempt to renegotiate the terms of any agreement which restricts full cost recovery.

--Discontinue the use of fixed prices in billing for reimbursable launches until records and procedures are established to ensure reasonably complete and accurate cost forecasts.

We also recommend that the Secretary of Defense and the Secretary of the Air Force establish procedures for timely review of estimates and surcharges to assure accuracy and currency.

CHAPTER 4

SCOPE OF REVIEW

We reviewed NASA's and DOD's policies, procedures, and practices used in charging costs to reimbursable launches and evaluated the equity of such charges. We made our review at Kennedy Space Flight Center, AFETR, AFWTR, SAMSO, Goddard Space Flight Center, and at NASA and Air Force Headquarters in Washington, D.C. We also interviewed responsible Air Force and NASA officials at the field and headquarters locations.

Our review included Air Force and NASA charges for program management, procurement of the launch vehicles, launch support services, and orbital tracking services. We developed estimates of actual applicable costs on a full user charges basis.

Our review was concerned primarily with ESRO's HEOS A2 and TD/1A, the UK Skynet A and B, and the NATO A and B launches. However, we also examined generally into Air Force estimates of fixed price charges for support to NASA on Comsat Intelsat IV and Telesat Canada launches, but we did not review NASA's costs for such launches.

EXHIBIT A

COMPARISON OF GAO ESTIMATES WITH NASA AND AIR FORCE BILLINGS FOR UK AND NATO LAUNCH COSTS (note a)

	NASA billings	GAO estimate	Difference (-)
	(000 omitted)		
NASA costs:			
Project management and engineering support:			
Direct costs	$ 423	$ 423	$ -
Indirect costs	-	2,110	2,110
Total	423	2,533	2,110
Launch services	8,540	8,469	-71
Launch associated services	726	726	-
Other (launch vehicles, transportation, propellants)	10,039	10,036	-3
Depreciation expense	-	623	623
DOD contract administration	116	115	-1
Overhead and administration	279	601	322
Total NASA costs	20,123	23,103	2,980
	Air Force billings		
Air Force costs:			
Air Force launch support:			
Launch complex	453	1,317	864
Air Force support	1,573	4,694	3,121
Contractor support	1,643	4,869	3,226
Depreciation	-	680	680
Other support (non-Air Force tenants and military retirement)	72	256	184
Total Air Force support	3,741	11,816	8,075
Orbital support services	523	2,098	1,575
Program administration and management	834	1,675	841
Total Air Force costs	5,098	15,589	10,491
Total NASA and Air Force costs	$25,221	$38,692	$13,471

[a]Skynet A, Skynet B, NATO A, and NATO B launches.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

Oct 17, 1974

REPLY TO ATTN OF: SV

Mr. Fred J. Shafer
Director, Logistics and
Communications Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Shafer:

Thank you for the opportunity to comment on your initial draft report, and revisions thereof, entitled "Need to Recover the Full Costs of Reimbursable Special Interest Launches", B-87521. As stated in my letter dated August 7, 1974, to Associate Director Donald Eirich, representatives of NASA have been working closely with your staff to overcome major errors in the initial draft and to clarify significant aspects of NASA's reimbursement policy. These efforts resulted in a complete rewrite of Chapter 2 of the draft.

Despite the rewrite of Chapter 2 and numerous meetings during which NASA's policies and practices regarding reimbursement for special interest launches were discussed, significant facts and background concerning past and present NASA policies are still not disclosed in the draft report. Moreover, the digest of the report and the GAO's proposed statement of conclusions and recommendations, as of September 6, 1974, continue to convey suggestions of improprieties. Nowhere, to our knowledge, has any impropriety been identified by the GAO. The attempt to compare policies and practices of a later period to a prior period and to draw conclusions therefrom based upon a presentation of statistics could give rise to serious misunderstandings. For example, Exhibit A clearly implies an undercharging. This assumes that the auditor is correct in his assumption that full costs must have been charged. This assumption is not consistent with views of the GAO's own General Counsel.

The present policy of NASA, as you recognize in your report, is that: "NASA shall be reimbursed for all reasonable costs and charges related to launch vehicles and other equipment,

GAO note: Page references in this appendix may not refer to the final report.

materials, and services which are associated with space flights and provided pursuant to the terms of contracts or agreements with users."

We believe that this present NASA policy--as well as each preceding version thereof--is supported by ample statutory authority under sections 203(b)(5) and (6) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2473).

Further, we believe that, even without the foregoing authority, the respective versions of NASA's policy for recoupment of costs for special interest launches were consistent with the intent and language of the user charges statute or the related policy statements of the President in 1966 and 1972. The user charges statute provides for discretionary flexibility since the fee or charge to be prescribed by the head of the Federal agency involved is to be "fair and equitable taking into consideration direct and indirect cost to the Government, value to the recipient, public policy or interest served, and other pertinent facts;" (underscoring supplied).

It should be understood that the determination of fair and equitable charges is a very complex problem which involves a multiplicity of factors such as the national interest, international cooperation and foreign policy, and numerous other pertinent factors not addressed in the draft report or considered in the conclusions. Benefit to the U. S. launch programs was but one of the specific factors considered by NASA which was ignored in the draft report. For example, increased reliability through added launch crew proficiency and reduced U. S. Government cost through (a) increases in number of vehicles produced, or (b) sharing in the annual program maintenance costs are direct tangible benefits to the U. S. Government. These and other pertinent considerations were explained to the GAO auditors, and apparently rejected by them, since the report contains no reference to NASA's rationale for the reimbursable bases for its launching and related services agreements, or to the circumstances prevailing at the times the pertinent agreements were made.

GAO's General Counsel held, in B 168707-O.M., 9/27/73, "... subsections 203(b)(5) and (6) of the National Aeronautics and Space Act of 1958, ... may be viewed as ample authority to perform launching and related services for foreign entities. ... the costs to be reimbursed by the foreign entities are those as may be agreed to by the parties concerned. ... it is clear that NASA is not required to contract on such (User Charges Statute) basis."

The GAO recommendation that the full cost principle should form the basis for calculating charges for all special interest launches is not supported by the facts contained in the report. To express this recommendation as a gratutitous substitute, without audit support, for the NASA decisions evidenced by the signed agreements certainly implies that GAO believes that NASA's decisions were wrong. The reasons for this substitute are not shown by the audit. Also, to apply this recommendation in the future as an absolute requirement would deny NASA the administrative flexibility that is permitted by Section 203(b)(6) of the National Aeronautices and Space Act, by the user charges statute, and by the implementing regulations.

In summary, it is our position that each of the respective NASA policies that evolved for the recoupment of charges for reimbursable special interest launches was based upon ample statutory authority and did, indeed, take into consideration the overriding significant factors prevailing at the time.

Our specific comments on the findings, conclusions, and recommendations contained in the draft report are provided in the enclosure.

We request that these comments, including the enclosure, be fully reproduced as an Appendix to your final report.

Sincerely,

Bernard Moritz

Bernard Moritz
Associate Administrator for
Organization and Management

Enclosure

NASA Comments on Certain Segments of the GAO Draft Report Titled "Need to Recover the Full Costs of Reimbursable Special Interest Launches, B-87521"

These comments pertain to the segments of the draft audit report that were revised and delivered to NASA on September 6, 1974, as follows: (a) Report Digest, (b) Chapter 1, "Introduction", (c) Chapter 2, "NASA Costs Not Fully Recovered" and (d) Exhibit A, consisting of a comparison of various cost estimates. It is NASA's understanding that the balance of the report draft is related to Air Force -- not NASA -- costs.

GENERAL COMMENTS

1. Factors and conditions not recognized by GAO

GAO's revised report segments do not present many of the factors and conditions that were considered by NASA in the negotiations of the terms for the respective agreements covering special interest launches.

Numerous references are made throughout GAO's draft report to "NASA's undercharges"; "inadequate and inequitable cost allocations"; "NASA omissions and errors"; "NASA's estimates were understated"; and "undercharges still exist". Also, the draft report concludes, "our findings demonstrate that large indirect costs for past and current reimbursable launches have not been billed and collected by NASA". Such language undoubtedly will leave readers with the impression that GAO determined valid and equitable amounts of costs that NASA should have recovered from foreign entities but did not. This would be most unfair because NASA's costing policies were entirely consistent with law, and the agreements which were validly entered into do not permit such cost recoveries.

The values that are labeled "GAO estimates" in Exhibit A and narrative portions of the draft report are very questionable. This is due to: (a) the methodology used in GAO's allocations of costs to the UK, NATO, and ESRO launches that were reviewed, (b) the inclusion of cost elements in the GAO estimates that are clearly inconsistent with the international agreements that governed these launches, and (c) the failure to recognize that the applicable reimbursement policies were properly based upon ample statutory authority. Even if these GAO values are characterized as "rough estimates", such connotation is lost in the portions of the report that contain the quoted references mentioned above. The overall effect will be very misleading to the reader.

2. Evolutionary modifications of NASA's policy

The revised report draft does not present the changes in NASA's policy for recoupment of costs for reimbursable launches that have evolved over a period of years as a result of changing circumstances, identification of new users of reimbursable launches, and NASA's experience with special interest launches.

The first U. S. Government activity directed toward the providing of launching services to a non-U. S. Government user began in 1960 when the American Telephone and Telegraph Company approached NASA with an inquiry on the providing of launching services. This inquiry eventually led to the launches of the Telstar experimental communications satellites. After this inquiry, NASA consulted with the GAO and other agencies for advice on precedents, reimbursement, the user charges statute, etc. This advice and other programmatic considerations led to the adoption by NASA of the "additional identifiable" charging principles which were used to recover the costs for these Telstar launchings. These policies were later discussed with the Congress (Hearings before the Senate Committee on Aeronautical and Space Sciences on H.R. 7500, 88th Congress, pages 1063 - 1069 on the NASA Authorization Act for 1964), and recognition of these policies was given on the Senate floor in the Congressional Record - Senate, 1963, pages 13777 - 13780. Detailed information concerning this policy and the resultant charges were provided to the Congressional Staffs and no objections were raised to the NASA reimbursement policy.

Since that time, however, circumstances have changed, and correspondingly, the NASA policy has changed through an evolutionary series of steps which tend to approach a full cost policy. In fact, the "additional identifiable" principles were modified after the initial Comsat (Earlybird) launching in CY 1965. This NASA change in policy was influenced by the fact that the Early bird satellite was experimental in nature and the subsequent launchings for Comsat were operational, revenue producing communications satellites. All launchings after Earlybird were conducted on a total direct cost plus a surcharge based on a percentage factor indirect charging principle.

The draft report ignores this chronology of the NASA policy and on an overall basis evaluates these previous NASA actions for the two ESRO launches and the four UK and NATO launches on the basis of today's circumstances. A significant factor in the previous policy decisions was that NASA wished to make its launch services available on as reasonable terms as possible to preserve the posture of cooperation in space which the United States has maintained from the beginning of the space age. NASA wished to encourage use of the launch services so as to contribute materially (in the language of section 102(c) of the Space Act) to the expansion of human knowledge of phenomena in the atmosphere and space; and to cooperate with other nations and groups of nations in work done and in the peaceful application of the results from space activities. This policy of nondiscriminatory reimbursable access to U.S. launching capability was subsequently reinforced by the President's October 9, 1972, statement of U.S. Launch Assistance Policy.

In summary, it is the NASA position: that NASA policy has been and is within the legislative authority granted to the agency; that charging practices have been and are consistent with these policies; and that any evaluation of the equity of these charges must consider all of the pertinent factors involved in making such complex judgments, and evaluate the relevancy of these factors.

SPECIFIC COMMENTS ON GAO FINDINGS AND CONCLUSIONS

GAO finding: "Both NASA and Air Force procedures for identifying applicable costs and methods of allocating them to reimbursable launches were inadequate and inequitable." (Draft pages 2 and 18)

This conclusion is unsupported by anything contained in the portions of the report pertaining to NASA. The GAO draft report implies that NASA did not give consideration to "full costs" in determining its charging policy. This implication is false.

At the time that the NASA charging policy decisions were made for the Intelsat II Program, full cost was considered (but not adopted) and the percentage surcharges were intended to recover unidentified overhead and indirect expenses. The

GAO review did not investigate or challenge the validity of these surcharges.

As an illustration of NASA's periodic adjustments made to help keep reimbursable launch costs adequate and equitable, NASA has recently added a separate identifiable use or rental charge in lieu of depreciation and changed the method of computing indirect costs. The current NASA formula for the determination of indirect costs is provided as Attachment A.

The following facts are offered to point up deficiencies in the GAO calculations of indirect expenses and allocations thereof on the basis of number of launches made during the year. At the same time these facts support the NASA calculations: (pages 22-23 and 28-29)

1.) During the period that the launches considered in the draft report were performed, the only direct Delta project expenses which were segregated or accounted for separately were the expenditures on these specific or other reimbursable missions.

2.) All other expense (direct and indirect) was allocated to the Delta Project pool. This pool included: time on NASA mission specific support, major and minor design, development, test and engineering tasks, new mission support, and support provided to other NASA programs, e.g., Centaur, Scout, etc.

3.) The methodology used by the GAO in computing its estimates did not consider any of these factors with the exception of a single allowance of $70K which was to represent an allowance of direct support to all of NASA missions during the year.

4.) The $70K allowance was based on the average direct time booked against five reimbursable missions - Intelsat III E, F, G; Skynet A; and NATO A. Of these five reimbursable missions, only the Skynet A can be considered a first-of-a-kind mission (which requires more support than the repeat missions) while each of the NASA missions during that period was a first-of-a-kind mission. Thus, this $70K allowance was significantly understated.

5.) Major and minor vehicle improvements were underway at the time these missions were launched. This activity which was supported by the Delta Project pool and other activity which supported other NASA projects can, in no way, be considered as benefitting launches occurring during that period. Hence, no part of such expense should be allocated to the six launches audited by GAO.

6.) GAO's failure to properly consider these facts resulted in inadequate adjustments (deductions) from the Delta Project pool. The effect of GAO's allocations was that too much indirect expense was attributed to each of the six audited launches. While it may be somewhat reasonable to allocate launch complex costs based on the number of launches, it does not follow that this principle can or must be applied to a project office at GSFC or KSC. The inequities of the methodology used by GAO become apparent when the indirect expenses allocated by GAO to each of the audited launches are considered.

Using information in the draft report, the total indirect costs of project management and engineering support were $3,074,301 in FY 1970; $3,074,301 in FY 1971; and $3,277,217 in FY 1972. While these totals were relatively close, the portions allocated by GAO to the audited launches ranged from $824,398 (for Skynet-A and NATO-A) in FY 1970; to $1,285,268 (for Skynet-B and NATO-B) in FY 1971; to $1,484,985 (for HEOS-A2 and TD-1A) in 1972. The inequities among individual reimbursable launches are apparent.

Therefore, it is NASA's opinion that GAO's calculations and, hence, the overall estimates of NASA alleged undercharges are unreasonable and misleading.

GAO finding: "The GSFC Delta Project Manager generally agreed with our method of allocating GSFC indirect costs. However, he thought that NASA's own launches should absorb a greater portion of the indirect costs than reimbursable launches." (page 22)

This is a mis-statement of fact. The Project Manager did not agree with the auditor's method of allocating indirect costs. He did agree that it was a method of allocating costs but not one which would produce equitable results.

GAO finding: "Because documentation was not available to support NASA and DOD cost estimates in many instances, GAO computations of costs were based in part on available data and in part on estimates. . . ." (page 3)

This statement on "cost estimates" implies a weakness in NASA's documentation of actual costs. We informed the GAO representatives that the users are ultimately billed on an actual cost basis and that the preliminary estimates, by their very nature, cannot foresee all possible circumstances which can lead to variations in the actual costs. NASA provided the GAO staff with extensive documentation in support of actual costs. At the time of the GAO review, the HEOS-A mission was the only mission on which actual cost data was then available. Subsequently, actual cost data on the Skynet and NATO missions became available and the GAO did not challenge the NASA cost data.

SPECIFIC COMMENTS ON GAO RECOMMENDATIONS TO ADMINISTRATOR OF NASA

1. Adopt and enforce a policy for recovery of full user charges in future negotiations for all reimbursable launches.

As stated in the GAO report, the National Aeronautics and Space Act of 1958 provides NASA with authority to enter into contracts, leases, etc., under which the costs to be reimbursed are those as may be agreed to by the parties concerned. NASA Policy Directive 8610.5, effective January 12, 1973, outlines the general agency guidelines with respect to reimbursement policy. In general, NASA agreements and contracts implemented under this directive shall state that the user shall reimburse NASA "for all costs which are incurred by the United States Government in connection with, or incident to, the furnishing of launching and associated services under this contract." However, NASA feels that it must retain the flexibility provided by Section 203(b)(5) and (6) of the National Aeronautics and Space Act, which will be used when appropriate.

2. Establish procedures to provide for documentary support and timely review of cost estimates and surcharges to assure accuracy and currency.

NASA has always provided documentary support of its final costs (actual costs). The principles employed for final costing are now used as well for the initial and updated estimates. Current procedures call for a review of estimates on a semiannual basis.

Furthermore, all estimates must be reviewed and approved by the NASA Comptroller prior to their release. This procedure was also previously employed only on final charges (actual costs).

3. Recompute costs on a full user charges basis and submit billings thereon for the four NATO and UK launches discussed above and other such launches, on which final payment has not been made.

It is the NASA position that the Administrator of NASA would have the discretion to revise the billings and submit them to the Air Force, or on the basis of Section 203(b)(5) and (6) of the Space Act to determine that a revision of the billings would not be justified.

The Air Force informed the General Accounting Office, on July 23, 1974, that although the amount billed UK and NATO does not satisfy a full user charge basis, nevertheless, the Air Force regards the amount as an appropriate billing and will not revise it, for the reasons stated therein. NASA is not in a position to question the Air Force's justification and shall not. Moreover, to issue a revised billing to the Air Force would be incompatible with the President's statement of October 9, 1972, which states a policy that United States launch assistance shall be provided foreign countries and international organizations on a non-discriminatory basis. To issue a revised billing to the Air Force and thru it the UK and NATO, in an increased amount, would discriminate against the UK and NATO in the sense that their costs would be computed on a different basis than the costs billed by NASA to other countries and organizations. It should be also noted that NASA has already submitted final billings to the Air Force for the UK and NATO launches and received payment in full.

4. Require internal audits to insure that cost estimates and billings for reimbursable launches are made in accordance with NASA policy and procedures, and Government laws and regulations.

While we agree that internal auditing is essential to the management process, the recommendation, as written, conveys an inference that the accuracy and completeness of cost estimates and billings for reimbursable launches may have suffered in the past. This has not been shown by the audit to be the case. The accuracy and completeness of cost estimates and billings have been subject to thorough review in the course of NASA's established program and financial processes. GAO's audit takes issue with certain of the cost principles employed but it does not reflect any significant inaccuracies incurred by NASA in costing under the principles which were applicable at any given point in time.

Concerning internal audit specifically, we initiated a major audit effort in August 1973. This effort is directed specifically to the procurement of launch vehicles and subsequent launches at KSC of a group of communications satellites for a commercial venture. The initial phase of the audit was concerned mostly with the adequacy of accounting systems of NASA's hardware and launch contractors, as well as GSFC and KSC in-house procedures, for cost accumulation and billing to the venture. An interim audit report was issued February 15, 1974. Although our major audit effort is concerned primarily with a particular group of upcoming launches, we plan that the audit effort will help assure that NASA's overall accounting system will serve satisfactorily for all future launches.

APPENDIX I

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546
Apr. 16, 1973

REPLY TO ATTN OF BR

MEMORANDUM

TO: S/Associate Administrator for Space Science

FROM: B/Comptroller

SUBJECT: Agency Overhead and Administrative Expenses Charges for Non-Government Users of the Delta Launch Vehicle

The new reimbursable policy directive (NPD 8610.5) calls for charging non-Government reimbursable customers for overhead and administrative expenses incurred both at Headquarters and at the Centers. In the past, "agency-level" overhead and administrative expenses were recovered from the customer by applying a rate of 1% and 15% to various items of recurring and non-recurring costs. Because the new policy directive changes the scope of the charges in this area, my office has performed a general analysis of the overhead expenses involved in supporting direct program personnel at GSFC, KSC (Unmanned Launch Operations), and Headquarters.

The results of this analysis indicate that the overhead charge for Headquarters should be approximately 10%, for Goddard 90%, and for KSC (ULO) 106% -- as applied to the NASA direct personnel and related costs, including travel, expended in support of the reimbursable customer. These costs are currently categorized for Delta under "Project Management and Engineering Support." (The derivation of the percentages is outlined in Enclosure A).

The application of the rates derived from the analysis of the personnel and related costs for indirect personnel plus other indirect costs at the Centers and Headquarters appears to offer a generally satisfactory method for complying with the intent of the policy directive. This approach presents two possible difficulties, however: 1) the validity of the analysis depends heavily on the accuracy of the Center's identification of personnel as

direct or indirect personnel and amount of the R&D "Base Support" identified in the institutional base study, and 2) the reliance placed on the assumption that the direct personnel and related costs, including travel, offer a true measure of the direct costs involved in supporting a customer's mission. When a more exhaustive analysis of the supporting costs can be completed, possible shortcomings in this method of charging for overhead and administrative costs can be identified and the methodology accordingly improved.

Until that time, non-Government reimbursable users of the Delta launch vehicle will be charged for overhead and administrative expenses at Headquarters and GSFC at a rate of 100% (90% plus 10%) on all direct GSFC personnel and related costs including travel, and 116% (106% plus 10%) on all direct KSC personnel and related costs, including travel, incurred in support of the users' missions.

Wm. E. Lilly

Enclosure

APPENDIX I

ATTACHMENT A

	GSFC	KSC (ULO)	HQ.
Average Personnel and Related Costs Computation			
A. Total Personnel Cost (P&RC)	$79,270K	$ 4,917K	$39,891K
B. Total Permanent Positions	3,966	238	1,731
C. Average P&RC per permanent Positions (A ÷ B)	$19,987	$20,660	$23,045
Indirect Cost Computation			
D. Number of Indirect Positions	1,163	63	731
E. Indirect P&RC (C X D)	$23,245K	$ 1,302K	$16,846K
F. Other R&PM Costs (1973 Budget Plan Excluding Program Related Travel)	$13,231K	$ 2,407K	$20,695K
G. R&D Funded Base Support (From Institutional Cost Study)	$14,085K	$ 133K	$ 100K
Total Indirect Costs	$50,561K	$ 3,842K	$37,641K
Average Indirect Cost per Direct Position			
H. Total Indirect Cost	$50,561K	$ 3,842K	$37,641K
I. Number of Direct Positions	2,803	175	18,813
J. Average Indirect Cost per Direct Position (H ÷ I)	$18,038	$21,952	$ 2,001
Average Indirect per Direct Position	$18,038	$21,952	$ 2,001
Average P&RC per Permanent Position	$19,987	$20,660	$23,043
K. Overhead Rate (J ÷ C)	90.2%	106.3%	10.2%

DEPARTMENT OF THE AIR FORCE
WASHINGTON 20330
JUL 23, 1974

OFFICE OF THE ASSISTANT SECRETARY

Mr. Fred J. Shafer
Director, Logistics and Communications Division
U. S. General Accounting Office
441 G Street, N. W.
Washington, D. C. 20548

Dear Mr. Shafer:

The Secretary of Defense has asked me to reply to your letter of May 9, 1974, which transmitted copies of your draft report entitled, "Need to Recover the Full Costs of Reimbursable Special Interest Launches," B-87521, (OSD Case #3830).

We appreciate your observation that, since the GAO review of costs relative to COMSAT's earlier Intelsat launches (B-168707, October 8, 1971), the Air Force has increased its efforts to identify costs on a full user charges basis. You are assured that any omissions or misclassifications of cost identified in your current draft report will be given careful consideration in future Air Force billings of special interest launches. Our comments on recommendations in the draft report, which are addressed to the Secretary of the Air Force, are provided in the attachment.

In summary, the Air Force has adopted and will continue to strive to achieve a policy of full user charges for all launch support services furnished to nongovernment users; procedures are being established to improve documentary support of cost estimates; we believe that revising the billing methods for the UK and NATO launches negotiated in 1966-1968 at this late date will be detrimental to good international relations; the Air Force Audit Agency should selectively review cost estimates and billings and thereby remain independent of management line operations; the fixed price billing concept as refined will provide a fair and efficient method for billing nongovernment users of range support services; and the Secretaries of Defense and the Air Force agree that periodic reviews are required to assure the accuracy and currency of estimates and surcharge rates.

The Air Force appreciates the opportunity to comment on this draft report.

Sincerely,

WILLIAM W. WOODRUFF
Assistant Secretary of the Air Force
(Financial Management)

1 Attachment
Air Force Comments

AIR FORCE COMMENTS ON GAO RECOMMENDATIONS

- Enforce the Air Force policy for recovery of full user charges in future negotiations of all reimbursable launches. In commenting on the 1971 GAO report, the Air Force agreed that user charges should be employed in costing special interest launches. While the Air Force continues to support this policy, it must be recognized that since user charges need not be supported by formal cost accounting systems, many aspects of the billing process become a "cost finding" exercise. Your report recognizes that, in many areas, alternative approaches may be taken in computing costs. With respect to the issue of enforcement, Hq AFSC has established an Ad Hoc Group to review operating procedures and directives to insure that prescribed Air Force policies are observed.

- Establish procedures to provide for documentary support of cost estimates. With respect to the UK and NATO launches, we understand that the issue of documentary support relates primarily to the costs of orbital support services and program administration and management rather than launch support services which constitute the largest cost category. The Air Force agrees that the documentation supporting these cost estimates needed improvement and the Hq AFSC Ad Hoc Group will also address this issue.

- Recompute costs on a full user charges basis and submit billings based thereon for the four UK and NATO launches. The draft report states that Air Force estimates of its costs for the four UK and NATO launches were understated by about $10.6 million. Exhibit A attached presents information on this issue with explanations as follows:

o Line 1 of Exhibit A discloses the estimates used in the official agreements with foreign governments which were executed during the 1966-1968 period. Chapter 2 of your 1971 report recognizes that during the 1962-1968 period, user charges policies for special interest launches were in a state of evolution. Various costing approaches were used for the Intelsat series including out-of-pocket costs, direct costs only, and direct plus indirect costs, but excluding depreciation. The estimates used in the UK and NATO launch agreements, as shown on line 1 of Exhibit A, were designed to recover an amount of costs which, at that time, was considered to constitute the "full value" of the services provided. In the light of the changing policies which existed with respect to cost definitions, it is not surprising that an additive cost approach was adopted in estimating certain cost elements and that other costs, such as depreciation, were completely excluded.

o Line 2 of Exhibit A discloses the bill which the Air Force believes generally conforms to the understandings of the contracting parties at the time of the agreement. This figure of $5.0 million, which is described in your draft report as the "current agency estimate," results in an increase of 34% over the original estimates of $3.7 million used in drafting the agreements.

o Line 3a of Exhibit A shows the GAO estimate of billings for these services on a "full cost" approach as $15.6 million. In computing launch support costs of $11.8 million, it may be noted that the GAO only identified $1.3 million as direct costs incurred at the launch complex. The balance of costs, $10.5 million, are indirect costs -- items of overhead and depreciation -- where considerable judgment and alternative methods can be employed to compute allocable costs.

o Line 3b of Exhibit A presents an alternative approach which results in a conclusion that billings under a full cost basis should not exceed $9.4 million, which is $6.2 million less than the comparable figure in the GAO report. The decrease in launch support costs from $11.8 million to $6.9 million is attributable primarily to the use of an alternative method of computing allocable overhead costs. This alternative approach was developed by an Air Force Task Group after determining that certain dedicated AF Eastern Test Range activities, such as range ships and down-range locations were not being given the same cost accounting treatment as the two launch complexes used for special interest launches. The overhead procedures employed by the Task Group are briefly described in Chapter 3 of your report under the discussion of fixed prices for the Intelsat IV launches.

The Air Force agrees that the $5.0 million current agency estimate figure does not satisfy a full user charges basis. Nevertheless, the Air Force regards this amount as an appropriate billing figure for the UK and NATO launches for the following reasons:

o Although, under the terms of the country-to-country agreements, increases to the estimates are proper (except for items 1 through 9 of the NATO agreement), the UK and NATO could reasonably expect that the final price would be computed in accordance with the costing procedures which were followed in establishing the original estimates and which were in use during the period that the services were provided.

o The magnitude of cost increases envisioned by the contracting parties is suggested by the language in the NATO and UK agreements which requires notification if costs increase by a factor of more than 10%. In contrast, Exhibit A discloses that the use of a full cost approach will result in inordinate cost increases. Depending on the specific costing method employed, this increase could be 150% to over 300% greater than the user could reasonably have expected.

o Basically, these large cost increases are caused by a change in cost allocation policy rather than in the scope of effort. Thus, these customers could reasonably maintain that the US Government's delay in preparing final billings has subjected users to a cost allocation policy change which is being applied retroactively simply because some cases are still open. Furthermore, changing US policy at this late date would deprive the UK and NATO of the option of terminating these cases before excessive costs were incurred.

o Increases in final billings of the magnitude that would result from using the revised costing formula could have an adverse impact on the continuing and mutually beneficial cooperative satellite communications programs with our allies, such as current negotiations with the UK for use of their satellite capacity in other areas of the world.

o The State Department has advised us that, in the light of all surrounding circumstances, it would not be in the best interests of good international relations to change the billing method for the UK and NATO launches at this late date.

- Require internal audit of cost estimates and billings for all reimbursable launches. Your report recognizes that Air Force internal auditors have reviewed billings at AF Eastern Test Range and that an internal auditor served as a member of the Air Force Task Group. More recently, the AF Audit Agency reviewed a cost analysis of Thor Delta-Scout special interest launches at the AF Western Test Range and reported that costs were reasonable and accurate and that general mission costs were distributed equitably. Air Force managers will request the AF Audit Agency (AFAA) to provide assistance, on a special request basis, whenever it is concluded that AFAA has expertise which may be useful in the costing of special interest launches. Your recommendation that cost estimates and billings for "all" reimbursable launches be reviewed by internal auditors appears to conflict with AFAA's charter which provides that it is a staff function, completely independent of management line operations. Accordingly, it is management's responsibility to ensure that its controls over the billing process are adequate; it is the auditor's responsibility to objectively appraise the effectiveness and efficiency of management controls.

- Recommend that the Secretary of Defense and Secretary of the Air Force establish procedures for timely review of estimates and surcharges to assure accuracy and currency. Department of Defense Instruction 7510.4, April 7, 1967, paragraph VII C states:

> "Rates should be reviewed at least annually by the Military Department and Defense Agencies, and recommendations for changes, if any, submitted for consideration and approval by the Assistant Secretary of Defense (Comptroller) with concurrence of the Assistant Secretary of Defense (Installations and Logistics)."

Based on completion of the prescribed review, the Assistant Secretary of Defense (Comptroller) on March 6, 1974, instructed the defense agencies to continue using the two percent surcharge unless the supplying Military Department determines that an actual or estimated charge should be applied. The Air Force intends to review the costs of administering communications satellite FMS cases and, if warranted, adjust the surcharge rate for future cases so that full costs are recovered.

Although it was not the subject of a recommendation, your draft report concludes that:

> "Because launch services, and therefore costs incurred, can vary substantially depending on the user's requirements, or merely from weather delays, we believe launch services are not the type of article for which fixed prices can be accurately determined. Further, it is particularly inappropriate to use fixed prices developed several years in advance of launches."

The Air Force agrees that each of the issues cited above poses a problem; however, we are encouraged that these problems can be accommodated through the judicious use of special fixed price arrangements such as the following:

o With respect to the issue of varying launch services, the first NASA/Air Force agreement provided that any change in services which resulted in a cost increase in excess of 10% may be the basis for additional cost recovery by the Air Force. In future agreements, it is contemplated that separate fixed prices will be used for significant special Air Force services, such as the use of ARIA aircraft.

o With respect to weather delays, we believe that a fixed price (which contains a factor, based on historical experience, for the average cost of delays for weather, equipment failures and other reasons) is a more equitable way of recovering this cost from all range customers.

o The use of fixed prices covering "several years" was the direct outgrowth of a concern expressed by NASA representatives that the Air Force would propose widely fluctuating prices if launch activity varied significantly from year to year (e.g., seven launches in first year; two in second year; ten in third year). NASA and the Air Force agreed that the use of fixed prices derived by averaging projected costs over two or more years would effectively eliminate this problem.

1 Atch
Comparison of Original Estimates,
Current AF Billings and Full
Cost Billings (Exhibit A)

Exhibit A

UK AND NATO LAUNCHES
COMPARISON OF ORIGINAL ESTIMATES, CURRENT AF
BILLINGS AND BILLINGS UNDER FULL COST APPROACH
($000)

	Launch Support	Orbital Support	Program Administration & Management	Total
1. Estimates used in official agreements	$ 2,600	$ 400	$ 723	$ 3,723
2. AF bill based on "understandings" of contracting parties	3,741	523	749	5,013
3. Billings under full cost approach:				
a. Per GAO report	11,816	2,098	1,675	15,589
b. Per Air Force	6,883	1,255(1)	1,232(2)	9,370

NOTES:

(1) The GAO estimate for NATO orbital support costs was $1,501; however, the NATO agreement limits this cost to $658 ($200 plus $458 of follow-on effort). Accordingly, the GAO total for orbital support costs ($2,098) has been reduced by $843 to $1,255.

(2) The GAO estimate for NATO program administration and management costs was $798; however, the NATO agreement limits this cost to a ceiling price of $355. Accordingly, the GAO total for program and administration ($1,675) has been reduced by $443 to $1,232.

DEPARTMENT OF STATE

Washington, D.C. 20520

August 16, 1974

Mr. J. K. Fasick
Director
International Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Fasick,

Enclosed are the Department of State comments on the General Accounting Office's draft report entitled, "Need to Recover the Full Costs of Reimbursable Special Interest Launches." The draft report was forwarded under cover of your letter of May 9, 1974, to the Secretary of State.

Very truly yours,

Richard W Murray

Richard W. Murray
Deputy Assistant Secretary
for Budget and Finance

Enclosure

Department of State comments on the General Accounting Office's Draft Report titled "Need to Recover the Full Costs of Reimbursable Special Interest Launches".

We have examined the issues noted in the draft report and in particular those regarding full user charges associated with the launching by NASA and DOD of foreign satellites under the provisions of the National Aeronautics and Space Act of 1958, the Foreign Assistance Act of 1961 (22 USC 2315(b)) and the Foreign Military Sales Act of 1968 (22 USC 2761).

The Department believes that it would be detrimental to the foreign policy interests of the United States to reopen negotiations regarding the cost basis for reimbursement in any instance where agreement has been reached and confirmed by the participating entities, and particularly objects to any attempt at retroactive recovery of additional user charges at this late date as suggested.

Each launch agreement involved negotiated estimates of cost, and while some minor adjustments in final billings can be made, a subsequent claim for added costs of the magnitude suggested by GAO would certainly cast serious doubt upon the good faith of our country in negotiating and carrying out our contractual obligations. Therefore, regardless of the legal or accounting justification of the GAO conclusions, we believe that this matter should be closed on those launches completed or on those for which contracts have been completed.

Until the NASA and DOD can establish accounting systems whereby the full user charges can be clearly defined in advance of negotiations with the customer, any attempt to apply retroactive charges probably will lead to an inequitable and discriminatory result. Moreover, such a result would not be in keeping with the policy enumerated in the US launch assistance statement of October 9, 1972, wherein the President recognized the desirability of mutually beneficial cooperation in space and stated that foreign users will be

charged on the same basis as comparable non-US Government domestic users. A significant increase in our launch costs, billed retroactively, would certainly discourage international cooperation and weaken the US role as leader in the international venture of space exploration.

Herman Pollack
Director
Bureau of International Scientific
and Technological Affairs

APPENDIX IV

PRINCIPAL OFFICIALS

RESPONSIBLE FOR ACTIVITIES

DISCUSSED IN THIS REPORT

	Tenure of office From	To
DEPARTMENT OF DEFENSE		
SECRETARY OF DEFENSE:		
James R. Schlesinger	June 1973	Present
William P. Clements (acting)	May 1973	June 1973
Elliot L. Richardson	Jan. 1973	Apr. 1973
Melvin R. Laird	Jan. 1969	Jan. 1973
Clark M. Clifford	Mar. 1968	Jan. 1969
Robert S. McNamara	Jan. 1961	Feb. 1968
DEPARTMENT OF THE AIR FORCE		
SECRETARY OF THE AIR FORCE:		
John L. McLucas	July 1973	Present
John L. McLucas (acting)	May 1973	July 1973
Dr. Robert C. Seamans, Jr.	Feb. 1969	May 1973
Dr. Harold Brown	Oct. 1965	Jan. 1969
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION		
ADMINISTRATOR:		
James C. Fletcher	Apr. 1971	Present
George M. Low (acting)	Sept. 1970	Apr. 1971
Thomas O. Paine	Apr. 1969	Sept. 1970
Thomas O. Paine (acting)	Oct. 1968	Apr. 1969
James E. Webb	Feb. 1961	Oct. 1968

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